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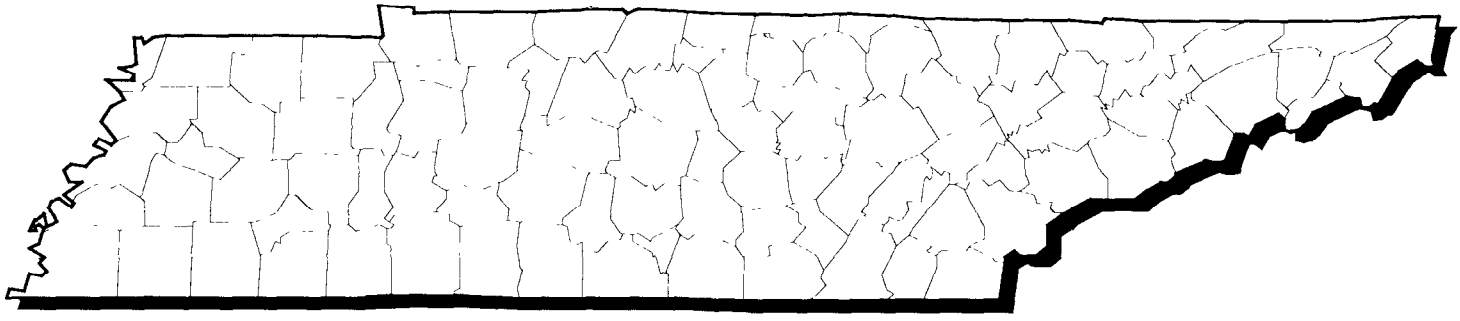
SUPERFUND: Progress at National Priority List Sites



TENNESSEE 1992 UPDATE

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NATIONAL PRIORITIES LIST SITES:

Tennessee

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Emergency & Remedial Response
Office of Program Management
Washington, DC 20460

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The complete set of the 49 State reports may be ordered as PB93-963250.

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INTRODUCTION

A BRIEF OVERVIEW OF SUPERFUND

During the second half of the Twentieth Century, the environmental consequences of more than 100 years of industrialization in the United States became increasingly clear. Authors such as Rachel Carson wrote passionately about the often-hidden environmental effects of our modern society's widespread use of chemicals and other hazardous materials. Their audience was small at first, but gradually their message spread. Growing concern turned to action, as people learned more about the environment and began to act on their knowledge

The 1970s saw environmental issues burst onto the national scene and take hold in the national consciousness. The first Earth Day was observed in 1970, the year that the U.S. Environmental Protection Agency (EPA) was founded. By the end of the 1970s, Love Canal in New York and the Valley of the Drums in

Kentucky had entered the popular lexicon as synonyms for pollution and environmental degradation.

Superfund Is Established

The industrialization that gave Americans the world's highest standard of living also created problems that only a national program could address. By 1980, the U.S. Congress had passed numerous environmental laws, implemented by the EPA, but many serious hazardous waste problems were slipping through the cracks.

Responding to growing concern about public health and environmental threats from uncontrolled releases of hazardous materials, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Popularly known as Superfund, CERCLA had one seemingly simple job—to uncover and clean up hazardous materials spills and contaminated sites.

A Big Job

Few in Congress, the EPA, the environmental community, or the general public knew in 1980 just how big the nation's hazardous materials problem is. Almost everyone thought that Superfund would be a short-lived program requiring relatively few resources to clean up at most a few hundred sites. They were quite mistaken.

As the EPA set to work finding sites and gauging their potential to harm people and the environment, the number of sites grew. Each discovery seemed to lead to another, and today almost 36,000 hazardous waste sites have been investigated as potential hazardous waste sites. They are catalogued in the EPA's computerized database, CERCLIS (for the Comprehensive Environmental Re-

sponse, Compensation, and Liability Information System).

The damage to public health and the environment that each site in CERCLIS might cause is evaluated; many sites have been referred to State and local governments for cleanup. The EPA lists the nation's most serious hazardous waste sites on the National Priorities List, or NPL. (These Superfund sites are eligible for federally-funded cleanup, but whenever possible the EPA makes polluters pay for the contamination they helped create.) The NPL now numbers 1,275 sites, with 50 to 100 added each year. By the end of the century, the NPL may reach as many as 2,100 sites.

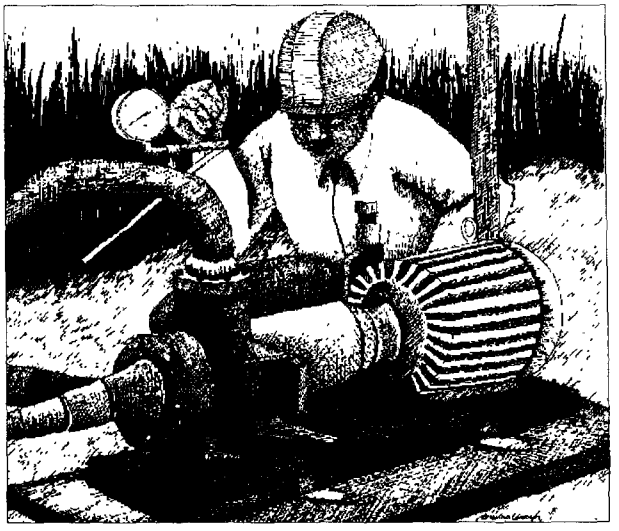
Superfund faces some of the most complex pollution problems ever encountered by an environmental program. Improperly stored or disposed chemicals and the soil they contaminate are one concern. More difficult to correct are the wetlands and bays, and the groundwater, lakes, and rivers often used for drinking water that are contaminated by chemicals spreading through the soil or mixing with storm water runoff. Toxic vapors contaminate the air at some sites, threatening the health of people living and working near by.

Superfund aims to control immediate public health and environmental threats by tackling the worst problems at the worst sites first. Wherever possible, Superfund officials use innovative treatment techniques—many developed or refined by the EPA—to correct hazardous materials problems once and for all. Many of the treatment techniques they use did not exist when the program was created.

The EPA Administrator had challenged Superfund to complete construction necessary for cleanup work at 130 NPL sites by the end of the 1992 federal fiscal year. By September 30, 1992, the end of fiscal year 1992, construction had been completed at a total of 149 NPL sites. Superfund is well on its way of meeting the Administrator's goal of completing construction at 200 NPL sites by the end of fiscal year 1993, and 650 sites by the end of fiscal year 2000.

Quick Cleanup at Non-NPL Sites

Long-standing hazardous waste sites are not Superfund's only concern. The EPA also responds to hazardous spills and other emergencies, hauling away chemicals for proper treatment or disposal. Superfund teams perform or supervise responses at rail and motor vehicle accidents, fires, and other emergencies involving hazardous substances. They also evacuate people living and working near by, if necessary, and provide clean drinking water to people whose own water is contaminated. Removal crews also post warning signs and take other precautions to keep people and animals away from hazardous substances.



Superfund employee prepares equipment for groundwater treatment.

Quick Cleanups, or Removals, are not limited to emergencies. When cleanup crews at contaminated sites find hazardous substances that immediately threaten people or the environment, they act right away to reduce the threat or to remove the chemicals outright. As the EPA implements the Superfund Accelerated Cleanup Model (SACM), more and more sites will undergo quick cleanups, and many of these will be cleaned up completely without ever being included on the NPL. (See "Streamlining Superfund: The Superfund Accelerated Cleanup Model.")

Some of Superfund's most significant gains in public health and environmental protection have been won by the removal program. As of March 31, 1992, the Emergency Response Program had logged more than 2,300 removal completions since Superfund was established.

Superfund employee removing drums from a Superfund site.

The Public's Role

Superfund is unique among federal programs in its commitment to citizen participation. Although the EPA is responsible for determining how dangerous a site is and how best to clean it up, the Agency relies on citizen input as it makes these decisions.

Community residents are often invaluable sources of information about a hazardous waste site, its current and previous owners, and the activities that took place there. Such information can be crucial to experts evaluating a site and its potential dangers.

Residents also comment on EPA cleanup plans by stating their concerns and preferences at public meetings and other forums and in formal, written comments to Agency proposals. The EPA takes these comments and concerns seriously, and has modified many proposals in response to local concerns. For, ultimately, it is the community and its citizens that will live with the results of the EPA's decisions and actions; it is only fair that citizens participate in the process.

A Commitment to Communication

The Superfund program is very serious about public outreach and communication. Community relations coordinators are assigned to each NPL site to help the public understand the potential hazards present, as well as the cleanup alternatives. Local information repositories, such as libraries or other public buildings, have been established near each NPL site to ensure that the public has an opportunity to review all relevant information and the proposed cleanup plans.

The individual State volumes contain summary fact sheets on NPL sites in each State and territory. Together, the fact sheets provide a concise report on site conditions and the progress made toward site cleanups as of March 1992. The EPA revises these volumes periodically to provide an up-to-date record of program activities. A glossary of key terms relating to hazardous waste management and Superfund site cleanup is provided at the back of this book.

INTRODUCTION

Superfund is, of course, a public program, and as such it belongs to everyone of us. This volume, along with other State volumes, comprises the EPA's report on Superfund progress to the program's owners for the year 1992.

STREAMLINING SUPERFUND: THE SUPERFUND ACCELERATED CLEANUP MODEL

Historically, critics and supporters alike have measured Superfund's progress by the number of hazardous waste sites deleted from the NPL. Although easy enough to tally, this approach is too narrow. It misses the major gains Superfund makes by reducing major risks at the nation's worst hazardous sites long before all clean-up work is done and the site deleted. It also ignores the Removal Program's contributions to meeting Superfund's twin mandates of maximizing public health and environmental protection.

Renewing Superfund's commitment to rapid protection from hazardous materials, the EPA is streamlining the program. The Superfund Accelerated Cleanup Model, or SACM, will take Early Actions, such as removing hazardous wastes or contaminated materials, while experts study the site. SACM also will combine similar site studies to reduce the time required to evaluate a site and its threats to people and the environment. This way, immediate public health and environmental threats will be addressed while long-term cleanups are being planned.

Emergencies such as train derailments and motor vehicle accidents will continue to be handled expeditiously. Teams of highly trained technicians will swing into action right away, coordinating the cleanup and removal of hazardous substances to ensure public safety as quickly as possible.

Breaking With Tradition

The traditional Superfund process begins with a lengthy phase of study and site assessment, but SACM will save time by combining separate, yet similar, activities. Each EPA Region will form a Decision Team of site managers, risk assessors, community relations coordinators, lawyers, and other experts to monitor the studies and quickly determine whether a site requires Early Action (taking less than five years), Long-term Action, or both.

While the site studies continue, the Decision Team will begin the short-term work required to correct immediate public health or environmental threats from the site. Besides removing hazardous materials, Early Actions include taking precautions to keep contaminants from moving off the site and restricting access to the site. Early Actions could eliminate most human risk from these sites, and Superfund will further focus its public participation and public information activities on site assessment and Early Action.

Long-Term Solutions

While Early Actions can correct many hazardous waste problems—and provide the bulk of public health and environmental protection—some contamination will take longer to correct. Cleanups of mining sites, wetlands, estuaries, and projects involving incineration of contaminants or restoration of groundwater can take far longer than the three to five years envisioned for Early Actions. Under SACM, these sites will be handled much as they are now.

Also under SACM, the EPA will continue its pursuit of potentially responsible parties who may have caused or contributed to site contamination. Expedited enforcement and procedures for negotiating potentially responsible party settlements will secure their participation. Superfund personnel will continue to oversee clean-up work performed by potentially responsible parties.

HOW SUPERFUND WORKS

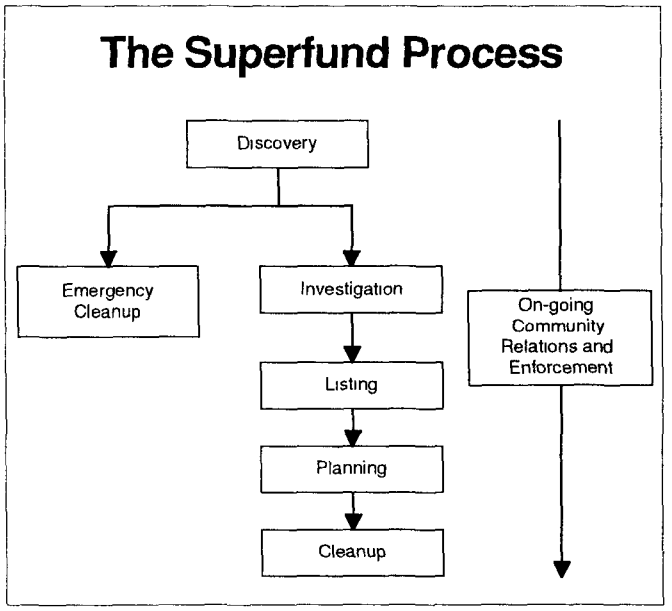
Each Superfund site presents a different set of complex problems. The same hazardous materials and chemicals often contaminate many sites, but the details of each site are different. Almost always, soil is contaminated with one or more chemicals. Their vapors may taint the air over and around the site. Contaminants may travel through the soil and reach underground aquifers which may be used for drinking water, or they may spread over the site to contaminate streams, ponds, and wetlands. The contaminating chemicals may interact with each other, presenting even more complicated cleanup problems.

Superfund's cleanup process is arduous and exacting. It requires the best efforts of hundreds of experts in science and engineering, public health, administration and management, law, and many other fields.

The average NPL site takes from seven to ten years to work its way through the system, from discovery to the start of long-term cleanup. Actual cleanup work can take years, decades if contaminated groundwater must be treated. Of course, imminent threats to public health or the environment are corrected right away.

The diagram to the right presents a simplified view of the cleanup process. The major steps in the Superfund process are:

- Site discovery and investigation to identify contaminants and determine whether emergency action is required;
- Emergency site work such as removing contaminants for proper treatment or disposal, and securing the site to keep people and animals away, if warranted by conditions at the site;
- Site evaluation to determine how people living and working nearby, and the environment, may be exposed to site contaminants;
- Detailed studies to determine whether conditions are serious enough to add the site to the National Priorities List of sites eligible for federally funded cleanup under Superfund;
- Selection, design, and implementation of a cleanup plan, after a thorough review of the most effective cleanup options, given site conditions, contaminants present, and their potential threat to public health or the environment.
- Follow-up to ensure that the cleanup work done at the site continues to be effective over the long term.



From the earliest stages, EPA investigators work hard to identify those responsible for the contamination. As their responsibility is established, the EPA negotiates with these "responsible parties" to pay for cleaning up the problem they helped create. This "enforcement first" policy saves Superfund Trust Fund monies for use in cleanups where the responsible parties cannot be identified, or where they are unable to fund cleanup work.

THE VOLUME

How to Use the State Book

The site fact sheets presented in this book are comprehensive summaries that cover a broad range of information. The fact sheets describe hazardous waste sites on the NPL and their locations, as well as the conditions leading to their listing ("Site Description"). The summaries list the types of contaminants that have been discovered and related threats to public and ecological health ("Threats and Contaminants"). "Cleanup Approach" presents an overview of the cleanup activities completed, underway, or planned. The fact sheets conclude with a brief synopsis of how much progress has been made in protecting public health and the environment. The summaries also pinpoint other actions, such as legal efforts to involve polluters responsible for site contamination and community concerns.

The fact sheets are arranged in alphabetical order by site name. Because site cleanup is a dynamic and gradual process, all site information is accurate as of the date shown on the bottom of each page. Progress always is being made at NPL sites, and the EPA periodically will update the site fact sheets to reflect recent actions and will publish updated State volumes. The following two pages show a generic fact sheet and briefly describe the information under each section.

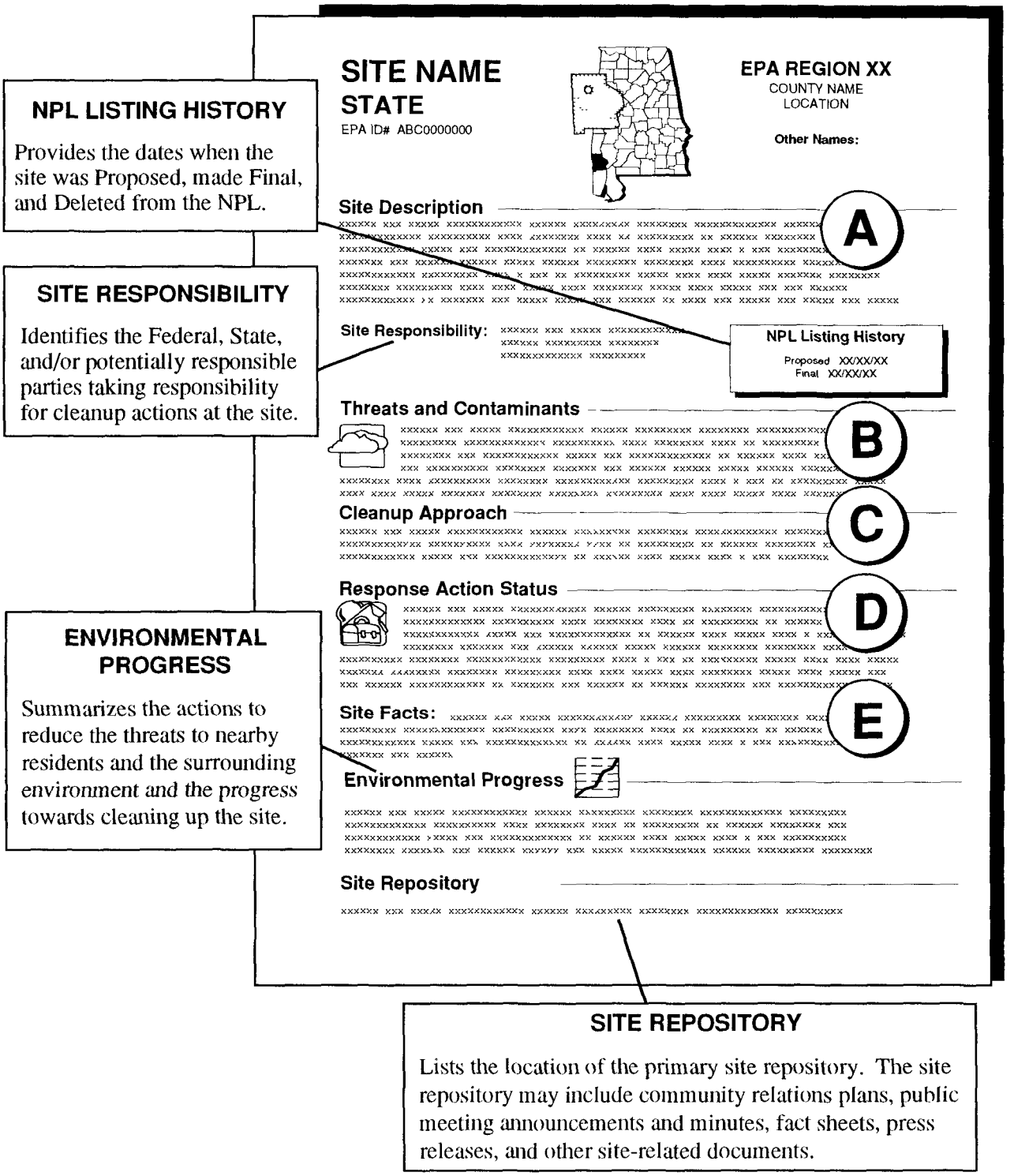
How Can You Use This State Book?

You can use this book to keep informed about the sites that concern you, particularly ones close to home. The EPA is committed to involving the public in the decision making process associated with hazardous waste cleanup. The Agency solicits input from area residents in communities affected by Superfund sites. Citizens are likely to be affected not only by hazardous site conditions, but also by the remedies that combat them. Site cleanups take many forms and can affect communities in different ways. Local traffic may be rerouted, residents may be relocated, temporary water supplies may be necessary.

Definitive information on a site can help citizens sift through alternatives and make decisions. To make good choices, you must know what the threats are and how the EPA intends to clean up the site. You must understand the cleanup alternatives being proposed for site cleanup and how residents may be affected by each one. You also need to have some idea of how your community intends to use the site in the future, and you need to know what the community can realistically expect once the cleanup is complete.

The EPA wants to develop cleanup methods that meet community needs, but the Agency only can take local concerns into account if it understands what they are. Information must travel both ways in order for cleanups to be effective and satisfactory. Please take this opportunity to learn more, become involved, and assure that hazardous waste cleanup at "your" site considers your community's concerns.

THE VOLUME



NPL LISTING HISTORY

Provides the dates when the site was Proposed, made Final, and Deleted from the NPL.

SITE RESPONSIBILITY

Identifies the Federal, State, and/or potentially responsible parties taking responsibility for cleanup actions at the site.

ENVIRONMENTAL PROGRESS

Summarizes the actions to reduce the threats to nearby residents and the surrounding environment and the progress towards cleaning up the site.

SITE REPOSITORY

Lists the location of the primary site repository. The site repository may include community relations plans, public meeting announcements and minutes, fact sheets, press releases, and other site-related documents.

A

SITE DESCRIPTION

This section describes the location and history of the site. It includes descriptions of the most recent activities and past actions at the site that have contributed to the contamination. Population estimates, land usages, and nearby resources give readers background on the local setting surrounding the site.

B

THREATS AND CONTAMINANTS

The major chemical categories of site contamination are noted, as well as which environmental resources are affected. Icons representing each of the affected resources (may include air, groundwater, surface water, soil, and contamination to environmentally sensitive areas) are included in the margins of this section. Potential threats to residents and the surrounding environments arising from the site contamination also are described.

C

CLEANUP APPROACH

This section contains a brief overview of how the site is being cleaned up.

D

RESPONSE ACTION STATUS

Specific actions that have been accomplished or will be undertaken to clean up the site are described here. Cleanup activities at NPL sites are divided into separate phases, depending on the complexity and required actions at the site. Two major types of cleanup activities often are described: initial, immediate, or emergency actions to quickly remove or reduce imminent threats to the community and surrounding areas; and long-term remedial phases directed at final cleanup at the site. Each stage of the cleanup strategy is presented in this section of the summary. Icons representing the stage of the cleanup process (initial actions, site investigations, EPA selection of the cleanup remedy, engineering design phase, cleanup activities underway, and completed cleanup) are located in the margin next to each activity description.

E

SITE FACTS

Additional information on activities and events at the site are included in this section. Often details on legal or administrative actions taken by the EPA to achieve site cleanup or other facts pertaining to community involvement with the site cleanup process are reported here.

THE VOLUME

The "icons," or symbols, accompanying the text allow the reader to see at a glance which environmental resources are affected and the status of cleanup activities at the site.

Icons in the Threats and Contaminants Section

Contaminated *Groundwater* resources in the vicinity or underlying the site. (Groundwater is often used as a drinking water source.)

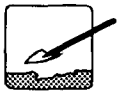
Contaminated *Surface Water and Sediments* on or near the site. (These include lakes, ponds, streams, and rivers.)

Contaminated *Air* in the vicinity of the site. (Air pollution usually is periodic and involves contaminated dust particles or hazardous gas emissions.)

Contaminated *Soil and Sludges* on or near the site. (This contamination category may include bulk or other surface hazardous wastes found on the site.)

Threatened or contaminated *Environmentally Sensitive Areas* in the vicinity of the site. (Examples include wetlands and coastal areas or critical habitats.)

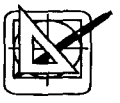
Icons in the Response Action Status Section



Initial, Immediate, or Emergency Actions have been taken or are underway to eliminate immediate threats at the site.

Site Studies at the site to determine the nature and extent of contamination are planned or underway.

Remedy Selected indicates that site investigations have been concluded, and the EPA has selected a final cleanup remedy for the site or part of the site.

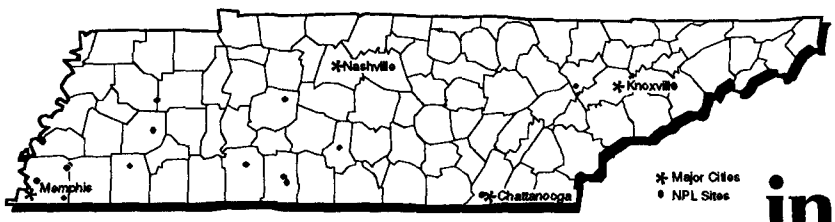


Remedy Design means that engineers are preparing specifications and drawings for the selected cleanup technologies.

Cleanup Ongoing indicates that the selected cleanup remedies for the contaminated site, or part of the site, currently are underway.

Cleanup Complete shows that all cleanup goals have been achieved for the contaminated site or part of the site.

A SUMMARY OF THE STATE PROGRAM



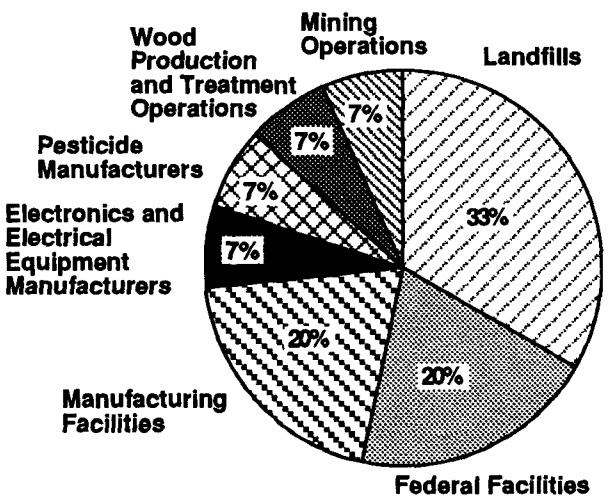
Superfund Activities in Tennessee

The State of Tennessee is located within EPA Region 4, which includes the eight southeastern States. The State covers 42,144 square miles. According to the 1990 Census, Tennessee experienced a 6 percent increase in population between 1980 and 1990, and is ranked seventeenth in U.S. population with approximately 4,877,000 residents.

The Tennessee Hazardous Waste Management Act of 1983, most recently amended in 1991, establishes the Hazardous Waste Remedial Action Fund and authorizes the State to take or compel polluters to take cleanup actions. The statute states that all polluters are liable for damages posed by the hazards regardless of fault. In the event that the State's cost are not recovered, the statute authorizes the State to place liens on property as a means of payment. In practice, the State may issue orders for information, access, and cleanup response; assess civil penalties; and impose punitive damages of up to 150 percent of the State's costs. In addition to the 10 percent contribution required from the State by the Federal Superfund program, State funding also is available for emergency response, removal and long-term cleanup actions, studies and designs, and operation and maintenance activities. To keep the community involved, a public meeting is required to allow participation in the remedy selection process. Hearings also are required prior to adding or deleting a site from the State priority list. Currently, 14 sites in the State of Tennessee have been listed as final on the NPL. One new site was proposed for listing in 1992.

The Tennessee Department of Environment and Conservation implements the Superfund Program in the State of Tennessee

Activities responsible for hazardous waste contamination in the State of Tennessee include:



Facts about the 15 NPL sites in Tennessee:

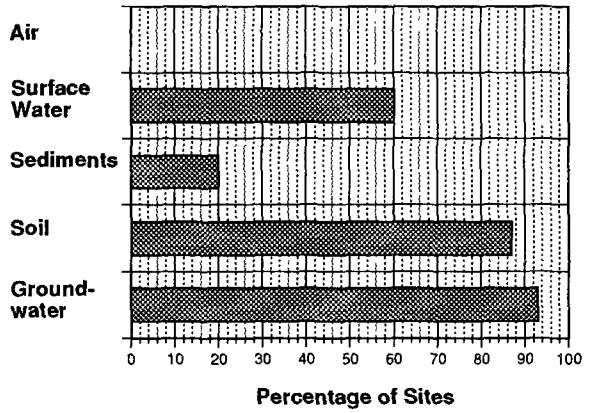
Immediate Actions (such as removing hazardous substances or restricting site access) were performed at 12 sites.

Five sites endanger sensitive environments.

Eleven sites are located near residential areas.

Most Sites Have Multiple Contaminants and Contaminated Media:

Media Contaminated at Sites



Contaminants Found at Sites

	Percentage of Sites
VOCs	73%
Heavy Metals	60%
Creosotes	27%
Pesticides/Herbicides	27%
PCBs	13%
Plastics	7%
Radiation	7%

The Potentially Responsible Party Pays...

In the State of Tennessee, potentially responsible parties are paying for or conducting cleanup activities at eight sites.

For Further Information on NPL Sites and Hazardous Waste Programs in the State of Tennessee Please Contact:

☎ EPA Region 4 Public Affairs Office	For information concerning community involvement	(404) 347-3004
☎ National Response Center	To report a hazardous waste emergency	(800) 424-8802
☎ Tennessee Department of Environment and Conservation: Division of Superfund	For information about the State's responsibility in the Superfund Program	(615) 532-0900
☎ EPA Region 4 Waste Management Division	For information about the Regional Superfund Program	(404) 347-5065
☎ EPA Superfund Hotline	For information about the Federal Superfund Program	(800) 424-9068

THE NPL REPORT

PROGRESS TO DATE

The following Progress Report lists all sites currently on, or deleted from, the NPL and briefly summarizes the status of activities for each site at the time this report was prepared. The steps in the Superfund cleanup process are arrayed across the top of the chart, and each site's progress through these steps is represented by an arrow (⇨) indicating the current stage of cleanup.

Large and complex sites often are organized into several cleanup stages. For example, separate cleanup efforts may be required to address the source of the contamination, hazardous substances in the groundwater, and surface water pollution, or to clean up different areas of a large site. In such cases, the chart portrays cleanup progress at the site's *most advanced* stage, reflecting the status of site activities rather than administrative accomplishments.

⇨ An arrow in the "Initial Response" category indicates that an emergency cleanup, immediate action, or initial action has been completed or currently is underway. Emergency or initial actions are taken as an interim measure to provide immediate relief from exposure to hazardous site conditions or to stabilize a site to prevent further contamination.

⇨ A final arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site currently is ongoing or planned.

⇨ A final arrow in the "Remedy Selection" category means that the EPA has selected the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy has been selected. In these cases, the arrows are discontinued at the "Remedy Selection" step and resume in the "Construction Complete" category.

⇨ A final arrow at the "Remedial Design" stage indicates that engineers currently are designing the technical specifications for the selected cleanup remedies and technologies.

⇨ A final arrow in the "Cleanup Ongoing" column means that final cleanup actions have been started at the site and currently are underway.

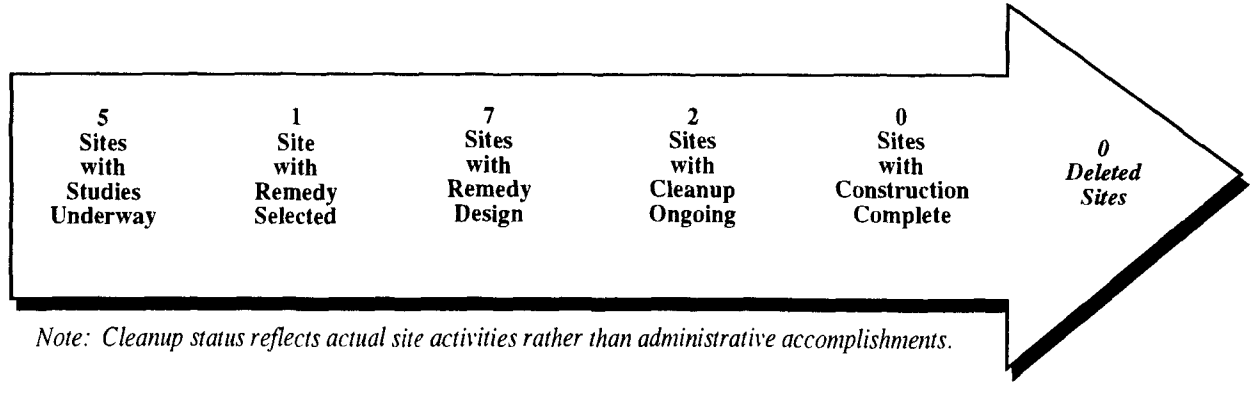
⇨ A final arrow in the "Construction Complete" category is used only when all phases of the site cleanup plan have been performed, and the EPA has determined that no additional construction actions are required at the site. Some sites in this category currently may be undergoing long-term operation and maintenance or monitoring to ensure that the cleanup actions continue to protect human health and the environment.

✓ A check in the "Deleted" category indicates that the site cleanup has met all human health and environmental goals and that the EPA has deleted the site from the NPL.

Further information on the activities and progress at each site is given in the site "Fact Sheets" published in this volume.

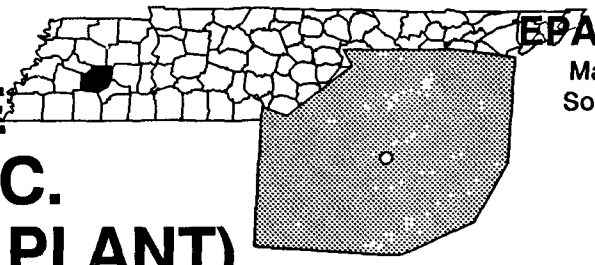
Progress Toward Cleanup at NPL Sites in the State of Tennessee

Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete	Deleted
AMERICAN CREOSOTE WORKS	MADISON	Final	06/01/86	⇨	⇨	⇨	⇨	⇨		
AMNICOLA DUMP	HAMILTON	Final	09/01/83		⇨	⇨	⇨			
ARLINGTON BLENDING AND PACKAGING	SHELBY	Final	07/07/87	⇨	⇨	⇨	⇨			
CARRIER AIR CONDITIONING CO.	SHELBY	Final	02/16/90	⇨	⇨					
GALLAWAY PITS	FAYETTE	Final	09/01/83	⇨	⇨	⇨	⇨	⇨		
LEWISBURG DUMP	MARSHALL	Final	09/01/83		⇨	⇨	⇨			
MALLORY CAPACITOR COMPANY	WAYNE	Final	10/04/89	⇨	⇨	⇨	⇨			
MEMPHIS DEFENSE DEPOT	SHELBY	Proposed	02/07/92		⇨					
MILAN ARMY AMMO PLANT	CARROLL/GIBSON	Final	08/21/87	⇨	⇨					
MURRAY-OHIO DUMP	LAWRENCE	Final	09/01/83	⇨	⇨					
MURRAY-OHIO MANUFACTURING CO. (HORSESHOE BEND DUMP)	LAWRENCE	Final	08/30/90	⇨	⇨					
NORTH HOLLYWOOD DUMP	SHELBY	Final	09/08/83	⇨	⇨	⇨	⇨			
OAK RIDGE RESERVATION (USDOE)	ANDERSON	Final	11/21/89	⇨	⇨	⇨	⇨			
VELSICOL CHEMICAL CORP.	HARDEMAN	Final	09/01/83	⇨	⇨	⇨	⇨			
WRIGLEY CHARCOAL PLANT	HICKMAN	Final	03/31/89	⇨	⇨	⇨				



Note: Cleanup status reflects actual site activities rather than administrative accomplishments.

AMERICAN CREOSOTE WORKS, INC. (JACKSON PLANT)



EPA REGION 4
Madison County
South of Jackson

TENNESSEE

EPA ID# TND007018799

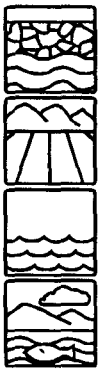
Site Description

The 60-acre American Creosote Works (Jackson Plant) site was a wood-treatment plant that began operations in the early 1930s and continued until late 1981, when the company filed for bankruptcy. Originally, the site consisted of the treatment buildings, pressure cylinders, boiler room tanks, oil storage tanks, tank cars, and railroad tracks. There also were four large wastewater lagoons, two sand filter units, and drip yards. Operators used creosote and pentachlorophenol (PCP) to treat and preserve wood. Workers discharged process wastewater directly to Old River Run until 1973, when a levee was built around the facility to contain surface water runoff and wastewater. From 1974 to 1975, the plant installed a wastewater treatment system. The pits created during construction of the levee were used to store treated process water and derivative sludges. Subsequently, flooding from the accumulation of rainfall caused the lagoons to overflow into the main process area. Jackson has a population of more than 60,000. A city well field lies approximately 1 1/2 miles east of the site, and several public and private wells are located within a 3-mile radius. The closest homes are located within a mile of the site. Homes with private wells are located upgradient from the site, a situation that lessens risk. The south fork of the Deer River, less than 1/4 mile from the site, receives runoff from the site via Central Creek and an unnamed tributary that follows the southern border of the site. Wetlands lying along both sides of the river support a large variety of wildlife species.

Site Responsibility: This site is being addressed through Federal and State actions.

NPL LISTING HISTORY
Proposed Date: 10/01/84
Final Date: 06/01/86

Threats and Contaminants



Groundwater underlying the facility and on-site soils are contaminated with volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and heavy metals from the wood-treating processes. Sediments contain PAH levels similar to those in soils. Cleanup workers may incur a health risk if they accidentally ingest contaminated soil or water.

Cleanup Approach

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the entire site and the water.

Response Action Status

Immediate Actions: In 1983, the EPA removed 30 million gallons of water from the site, treated 500,000 gallons of contaminated water, and solidified more than 100,000 cubic yards of sludge from on-site lagoons and treatment areas. Workers placed the solidified materials in an old lagoon and capped it with clay to await further cleanup. In 1986, EPA emergency staff treated about 225,000 gallons of contaminated water from the storage tanks using hydrated lime and polymers, and 28,000 gallons of oil were consolidated in one secured tank. Workers built covers for the treatment system and open storage tanks. In 1988, the tank area and a large portion of the site was fenced. As of 1989, the EPA completed a modification of the drainage system on the river side of the site, an effort being overseen by the State of Tennessee.

Entire Site: The following cleanup actions were selected in 1989 and have been completed: (1) the contaminated soils and sludge were removed from the process area and incinerated off site; (2) all tank liquids were treated and disposed of; (3) a security fence was installed around the entire site; and (4) the process area was cleaned up. Some construction debris still remains at the site. The State repaired the levee on the river side of the site, and a sump pump and a large drainage pipe to the river were installed. Further cleanup activities were completed in 1991. Treatability studies for the bioremediation of surface soils are planned. Final cleanup activities are scheduled for completion in mid-1992.

Water: Pending selection of the final remedy for cleaning up the water, the EPA intends to sample and monitor surface water behind the levee and discharge impounded water. Information is still being gathered to model the groundwater flow, and the semi-confining clay layer under the site is being examined. Although studies are still underway, the EPA plans to include removal of structures from outside the process area and other incidental construction in the final remedy.

Site Facts: A Superfund State Contract was signed in May 1989. Meetings with the U.S. Army Corps of Engineers and U.S. Geological Survey (USGS) were held concerning dike construction and groundwater characterization. In 1989, the EPA signed an Interagency Agreement with the USGS for a hydrogeological study to determine the nature and extent of contamination of the groundwater at the site. In March 1990, the USGS began the field work for this study, which is scheduled for completion in 1993.

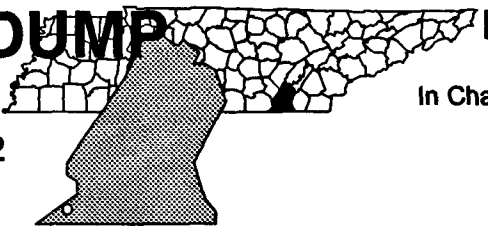
Environmental Progress

The numerous immediate actions to treat and contain wastes and a security fence at the site have reduced the potential for exposure to hazardous materials at the American Creosote Works (Jackson Plant) site. Final source control cleanup is nearly completed, and further investigations leading to the selection of a final groundwater remedy are taking place.

Site Repository

Jackson-Madison County Library, 433 Lafayette Street, East, Jackson, TN 38301

AMNICOLA DUMP
TENNESSEE
EPA ID# TND980729172



EPA REGION 4
Hamilton County
In Chattanooga, along the east bank of the Tennessee River

Site Description

The 18-acre inactive Amnicola Dump site, located in Chattanooga, was used for clay mining operations in the 1930s, and several water-filled pits were left behind. These subsequently were used for disposal of construction debris. The City operated the dump between 1964 and 1973, incinerating waste wood on site and disposing of the ashes over 12 acres. The operation was closed in 1973 due to concerns about unauthorized dumping and leachate seeping into the Tennessee River. Streams of leachate containing low concentrations of volatile organic compounds (VOCs) leave the site seasonally and enter the Tennessee River; however, water quality downstream has not been noticeably affected. The former site owner burned, stored, and handled creosote railroad ties, activities that contributed to elevated creosote contamination in the surface soil. The site lies in an industrial area, and about 150,000 people live within a 2-mile radius of the site. No residential areas are in the immediate vicinity, and the nearest population center is about 1/2 mile away. The site is situated along the eastern bank of the Tennessee River, 1/2 mile upstream from the city water intake, although no site-related contaminants have been found in the water.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

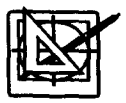
Threats and Contaminants

Groundwater, debris, and soil on the site contain polycyclic aromatic hydrocarbons (PAHs) and heavy metals including chromium from the incineration of waste wood. Sediments are polluted with phenols. People can be exposed to pollutants by coming in direct contact with contaminated soil or leachate or inhaling contaminants that evaporate into the air. The Tennessee River flows by the site and may be affected by contamination from the site.

Cleanup Approach

This site is being addressed in a single long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Entire Site: The EPA selected a final cleanup remedy for this site in 1989. It is intended to reduce the risks associated with exposure to contaminated, on-site surface soils and features: (1) excavating contaminated surface soil and debris and screening out debris; (2) treating contaminated soil by solidifying it to keep chemicals from moving; (3) restoring the ground surface to its original condition; (4) imposing restrictions on groundwater use and land use; (5) quarterly groundwater monitoring for four years; and (6) conducting a public health assessment five years after cleanup. The engineering design for the cleanup activities began in 1989 and are scheduled for completion in 1992.

Site Facts: In 1991, the EPA and the parties potentially responsible for site contamination signed a Consent Decree for these parties to take over engineering design and cleanup activities.

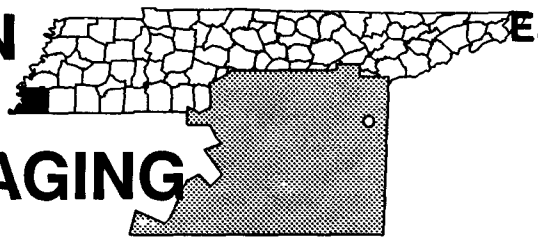
Environmental Progress

After adding this site to the NPL, the EPA performed preliminary investigations and determined that no immediate actions were needed at the Amnicola Dump site while cleanup activities are being planned.

Site Repository

Chattanooga Hamilton County Bicentennial Library, Local History Dept., 1001 Broad St., Chattanooga, TN 37402

ARLINGTON BLENDING AND PACKAGING



EPA REGION 4
Shelby County
Arlington

TENNESSEE
EPA ID# TND980468557

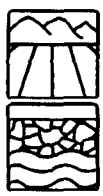
Site Description

From 1971 to 1978, the more than 2 acre Arlington Blending and Packaging site housed a pesticide blending and packaging operation, engaged in the mixing and packaging of various pesticides, herbicides, and other chemical formulas. During normal business operations, spills and leaks of chemicals handled at the site occurred. These chemicals soaked into site soils and building flooring and migrated off site through surface runoff and drain ditches. In the mid-1970s, the State took action against the company for its violations of the Clean Water Act, demanding that it reduce pesticide contamination in tributaries leading to the Loosahatchie River Canal. A 1976 report was issued by the company to satisfy State concerns. In 1979, after sampling the site and an adjacent housing development, the State recommended that the developer install a fence between the homes and the plant and apply 1 to 2 inches of clean topsoil in the backyards of the two homes closest to the plant. Between 1980 and 1983, the site owner removed some pesticide wastes from the site. The site is bordered by the Tennessee Department of Transportation facility to the west and a small residential area to the east of the site. The closest home is 50 feet away. Approximately 2,700 people live within 3 miles of the site, drawing drinking water from two water systems serving the communities of Arlington and Gallaway. An Arlington City well is within 1,200 feet of the site. The site is in the flood plain of the Loosahatchie River Canal, which is approximately 3,000 feet due north of the site. The probable drainage route from the site leads to a nearby canal that is used for recreation.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 07/07/87

Threats and Contaminants



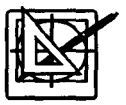
In 1983, the EPA discovered high concentrations of various pesticides in on-site soils and around the housing development. In 1985, the State detected pesticides in a shallow monitoring well from the deteriorating bags left on the site. The three water-bearing zones under the site are used as drinking water sources and have the potential for contamination from pesticide residues at the site. The upper zone is contaminated with chlordane and other pesticides. Although removal actions have reduced the potential for exposure of people to contaminants, any remaining groundwater contamination could threaten those who drink it.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on soil and groundwater cleanup.

Response Action Status

Immediate Actions: In 1983, the EPA removed 3,500 gallons of chemicals from the drums, collected debris, and excavated 1,920 cubic yards of contaminated surface soils both on and off the site. All materials were transported to EPA-approved disposal facilities. In 1990, the EPA, while conducting an investigation, discovered a significant concentration of pesticides in the backyard of a residence adjacent to the site. Immediate actions included the excavation and backfilling of the affected property, which eliminated the health risks posed to the residents.



Soil and Groundwater: In mid-1991, the EPA completed an intensive study of soil and groundwater pollution at the site. The selected remedy includes: excavation and decontamination of contaminated soil through on-site ex-situ thermal desorption; placement of the treated soil in excavated areas; dechlorination of liquids with off-site disposal; activated carbon treatment of the contaminated groundwater, with discharge of the treated effluent into surface water; and on-side solidification of soils containing arsenic and other trace metals. The design of the remedy began in 1992 and is expected to be completed in late 1993.

Environmental Progress

The immediate soil and drum removal actions described above have reduced the potential for exposure to hazardous materials at the Arlington Blending and Packaging site while cleanup activities are being designed.

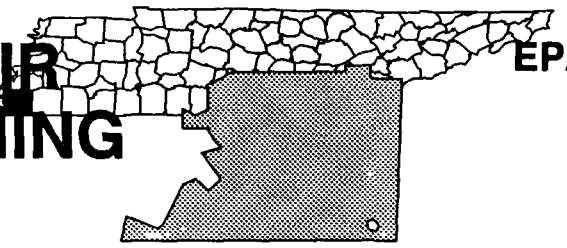
Site Repository

Arlington Public Library, 11968 Walker Street, Arlington, TN 38002

CARRIER AIR CONDITIONING COMPANY

TENNESSEE

EPA ID# TND044062222



EPA REGION 4
Shelby County
Collierville

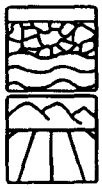
Site Description

Carrier Air Conditioning Company, part of United Technologies, manufactures air conditioners on approximately 145 acres of land. Three releases of trichloroethylene (TCE) to the environment have been documented. Starting in 1972, Carrier operated an unlined, 200-cubic-foot lagoon for storage of TCE-contaminated paint sludges, which leaked from 1972 to 1980. In 1978, a filter cover failed on a vapor degreaser, spilling 2,000 to 5,000 gallons of TCE. A third release occurred in 1985 when, following a period of heavy rainfall, an unknown volume of TCE leaked from underground pipes. The company was able to recover 542 gallons of TCE. As a result of this spill, wells were installed at the facility to monitor the Memphis Sands Aquifer. The Carrier facility is located within 2,000 feet of Water Plant Well #2 of the City of Collierville. An estimated 12,800 people obtain drinking water from wells in the aquifer within 3 miles of the site.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 02/16/90

Threats and Contaminants



TCE was detected in several monitoring wells at the facility in 1986 from plant operations. Low levels of TCE were found in both wells at Water Plant #2 of the City of Collierville. Soil samples collected at the spill site by the State in 1986 contained TCE. Direct contact with contaminated groundwater or soil may pose risks to people on the site, as may drinking or accidentally eating contaminated materials.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Immediate Actions: In 1980, Carrier removed wastes and soil from the lagoon and sent them to an EPA-regulated hazardous waste facility. In 1990, Carrier and the Town of Collierville designed and installed an air stripping system at the Well Field #2 treatment plant to remove TCE from raw water and allow the town to fully use Well Field #2.

Entire Site: In 1989, the parties potentially responsible for site contamination began a study of the nature and extent of site contamination, along with an assessment of techniques for site cleanup. A treatability study is underway at the former lagoon to demonstrate that soil vapor extraction is effective in cleaning up both soil and groundwater at the source of TCE. Studies are expected to be completed by summer 1992 at which time a final remedy will be selected.

Site Facts: The EPA and Carrier entered into an Administrative Order, requiring the potentially responsible parties to conduct a study to determine the extent of the contamination and to evaluate the technologies available for the cleanup.

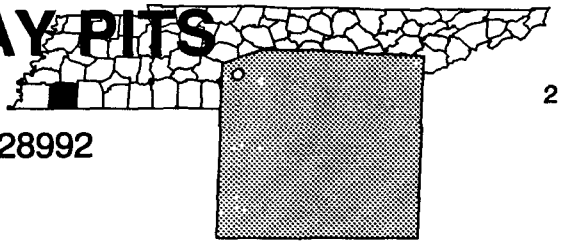
Environmental Progress

The removal of wastes and soil as well as the installation of an air stripping system, have reduced risks to the public health and the environment at the Carrier Air Conditioning Company while investigations are taking place.

Site Repository

Memphis Shilby County Public Library, 91 Walnut Street, Collierville, TN 38017

GALLAWAY PITS
TENNESSEE
EPA ID# TND980728992



EPA REGION 4
Fayette County
2 miles northeast of Gallaway

Other Names:
Gallaway Dump

Site Description

The Gallaway Pits site is on a 10-acre parcel of land that was extensively mined for sand and gravel, producing a landscape dotted with water-filled pits up to 50 feet deep. The site was used for unlicensed dumping of municipal and industrial wastes. Disposal of hazardous materials at the site occurred for an undetermined period of time, probably in the 1970s and 1980s. Wastes included pesticides, glass jars containing solid waste, residential trash, demolition debris, and appliances. Drums containing liquid waste were disposed of by emptying the drums into a small pond or by placing the entire drum into the pond. The site is underlain by sand and gravel, which facilitates the migration of the wastes on site and the possibility of contamination of the groundwater, surface water, and the soil. Approximately 50 homes are located within 1/2 mile of the site; the closest home is 1,600 feet away. These residents obtain drinking water from wells.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

Threats and Contaminants

Soil, groundwater, and surface water were contaminated with pesticides including chlordane and toxaphene from the former waste disposal activities. Direct contact with and ingestion of contaminated groundwater, surface water, or soil posed potential risks to individuals.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

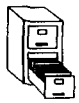
Immediate Actions: The EPA set up a water treatment system in 1983 to treat water from the pits at the rate of 100 gallons per minute. Approximately 360,000 gallons of water were treated, and 475 cubic yards (66 truckloads) of soil were removed and disposed of.

Entire Site: The EPA completed the following activities to clean up the site: excavation of contaminated sediments from the water pits on site and dilution of contaminated water in some water pits with the city water to meet water quality standards. The diluted water subsequently was discharged to an unnamed tributary. In addition, the groundwater was monitored, and a cap, designed and constructed to prevent the migration of contaminants, was installed. A fence also was erected around the site. The EPA completed the site cleanup in 1987 and will continue monitoring the site for 30 years.

Environmental Progress

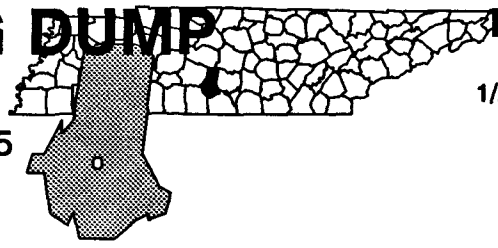
All cleanup activities have been completed at the Gallaway Pits site. The site now is safe to nearby residents and the environment while the EPA continues to monitor the site and prepares plans to delete it from the NPL.

Site Repository



Gallaway City Hall, 607 Watson Drive, Gallaway, TN 38036

LEWISBURG DUMP
TENNESSEE
EPA ID# TND980729115



EPA REGION 4
Marshall County
1/2 mile north of Lewisburg

Site Description

The 20-acre Lewisburg Dump operated as a municipal dump for 20 to 25 years. The site includes a 4-acre landfill and a 2-acre quarry pond. A State-sponsored geological survey found the site unfit for use as a sanitary landfill, and it was closed in 1979. The dump accepted mostly municipal waste and some industrial waste, such as inorganic chemicals and solvents. Waste partially filled a former limestone quarry that contains a shallow lagoon fed by groundwater. Runoff from the site enters an unnamed tributary to Big Rock Creek. The dump lies in a remote area; approximately 30 people reside in the nearest homes to the site, which are about 1/2 mile away. Private wells are located within 1/4 mile from the site.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

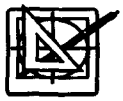
Threats and Contaminants

The soil, leachate, and surface water are contaminated with plastics, heavy metals including copper and volatile organic compounds from the site's dump activities. Pond sediments on site are similarly contaminated, but at much lower levels. One on-site well was contaminated with low levels of plastics. Direct contact with or accidentally ingesting contaminated groundwater, surface water, or soil may be harmful.

Cleanup Approach

This site is being addressed in a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status



Entire Site: In 1987, under EPA orders, several parties potentially responsible for site contamination began an intensive study of its pollution problems. The first phase of this investigation explored the nature and extent of site contamination; the second prescribed the best alternatives for final cleanup. The final draft of the study was reviewed by the EPA and the U.S. Geologic Survey (USGS). The investigation indicated the groundwater is contaminated at very low levels; however, monitoring and testing of the groundwater will be continued during design of the cleanup actions. The selected remedy includes regrading the cap and clearing the site of vegetation and garbage to prevent further infiltration. The design of the selected remedy began in 1991 and is scheduled for completion in late 1992.

Site Facts: The EPA signed a Consent Order with several potentially responsible parties to perform the study characterizing the contamination at the site. The parties recently agreed to pay the full costs of the selected cleanup actions.

Environmental Progress

After extensive investigations at the Lewisburg Dump, the EPA and the USGS have determined that no immediate threats exist while cleanup activities are being planned.

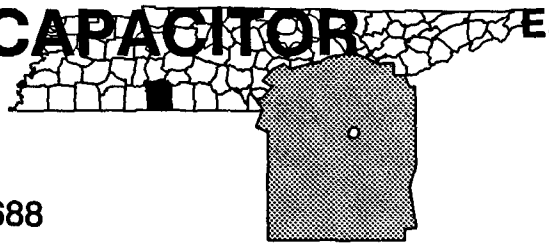
Site Repository

Marshall County Memorial Library, 310 Farmington Pike, Lewisburg, TN 37091

MALLORY CAPACITOR COMPANY

TENNESSEE

EPA ID# TND075453688



EPA REGION 4
Wayne County
Waynesboro

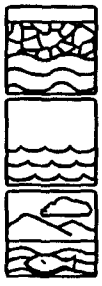
Site Description

Electrical capacitors were manufactured on the 8 1/2-acre Mallory Capacitor site from 1969 to 1984. The operators first used polychlorinated biphenyls (PCBs) as the dielectric fluid in the capacitors, switching to a plastics chemical in 1978. The factory changed hands when Dart Industries purchased it in 1979. Dart later sold the property in 1980 to Emhart Industries, Inc. As part of the sales agreement with Emhart, certain PCB wastes, a buried tank, and contaminated soil were removed from the site and sent to an approved PCB disposal facility. The plant continued to operate, but voluntarily closed in 1984 when PCBs were discovered throughout the site. The EPA found that PCBs entered the environment through spills, leaks, and intentional discharges. The plant is located in a small community. Approximately 900 people get drinking water from wells and springs within 3 miles of the site. The site is in the flood plain of the Green River. Surface water within 3 miles of the site is used for fishing and swimming.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 10/04/89

Threats and Contaminants



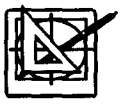
PCBs and volatile organic compounds (VOCs) have been detected in groundwater. Off-site wells are contaminated with PCBs and volatile organic compounds (VOCs) such as trichloroethylene (TCE) and dichloroethylene. Coming in contact with or accidentally ingesting contaminated groundwater could pose a human health threat. The presence of PCBs and VOCs poses a threat to the environment, as they are toxic to aquatic wildlife.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Immediate Actions: Before the start of the field work on the site study, the potentially responsible party removed, and sent to an approved disposal facility, approximately 20,100 tons of PCB-contaminated soil and 3,400 cubic yards of plant debris from 1988 to 1989.



Entire Site: In 1989, the potentially responsible party installed several monitoring wells on and off site to better define the extent of the contamination. Under EPA orders and monitoring, the potentially responsible party conducted an intensive investigation of the site's contamination. The study focused on the extent of PCB and VOC contamination. In 1991, the EPA selected a remedy which involves on and off site hydraulic containment of the contaminated groundwater plume with extraction and treatment. Possible toxicological effects to Cold Water Creek also will be assessed. The party potentially responsible site contamination began engineering designs for the remedy in early 1992. Cleanup is expected to begin in mid-1993.

Site Facts: The potentially responsible parties, working with the EPA under an Administrative Order, completed a study of the nature and extent of the contamination and identified possible cleanup solutions.

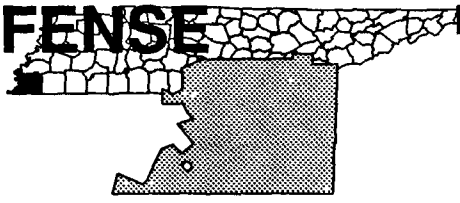
Environmental Progress

The immediate removal of contaminated soil and debris reduced the potential for exposure to contaminated materials at the Mallory Capacitor Company site while design of the cleanup activities is taking place.

Site Repository

Wayne County Public Library, U.S. Highway 64, East Waynesboro, TN 38485

MEMPHIS DEFENSE DEPOT
TENNESSEE
EPA ID# TN4210020570



EPA REGION 4
Shelby County
Memphis

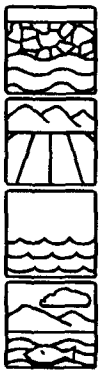
Site Description

The Memphis Defense Depot site comprises 642 acres in a mixed residential/commercial/ industrial area of south-central Memphis. The site consists of two adjacent sections: Dunn Field, an open storage and burial area of about 60 acres, and the main installation. The Depot, which is a major field installation of the Defense Logistics Agency, has been in operation since 1942. Its primary function is to provide material support, including clothing, food, medical supplies, electronic equipment, petroleum products, and industrial chemicals, to all U.S. military services, as well as some civilian agencies. To fulfill this function, the Depot has conducted numerous operations dealing with hazardous substances. A total of 75 waste disposal areas have been identified, primarily at the Dunn Field area. According to the Department of Defense (DOD), among the wastes disposed of are oil, grease, paint thinners, methyl bromide, and pesticides. In addition, stored materials have reportedly spilled and leaked at the main installation, as well as at Dunn Field, contaminating the soil with volatile organic compounds (VOCs), metals, polychlorinated biphenyls (PCBs), organics, and pesticides. An estimated 154,300 people obtain their drinking water from public and private wells within 4 miles of the site. The nearest well, which is within 1/2 mile of hazardous substances at the Depot, also provides water for commercial food production. These wells draw from deep groundwater, which is not currently contaminated. Until 1986, when the DOD found pesticides and PCBs in lake sediments and fish tissues, Lake Danielson was used for recreational fishing.

Site Responsibility: This site is being addressed through Federal actions.

NPL Listing History
Proposed Date: 02/07/92

Threats and Contaminants



Shallow groundwater is contaminated with the heavy metals arsenic, lead, chromium, and nickel, and the VOCs tetrachloroethane and tricloroethene. Soil is contaminated with various VOCs, metals, PCBs, organics such as polynuclear aromatic hydrocarbons (PAHs), and pesticides. The lake sediments are contaminated with the heavy metals cadmium, chromium, lead, and zinc.

Cleanup Approach

This site is being addressed in one long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Entire Site: The DOD is planning a full investigation of the nature and extent of contamination at the site. This study, scheduled to begin in mid-1993, will help to determine alternatives for cleanup at the site.

Site Facts: The Memphis Defense Depot is participating in the Installation Restoration Program, a specially funded program established by the DOD in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities.

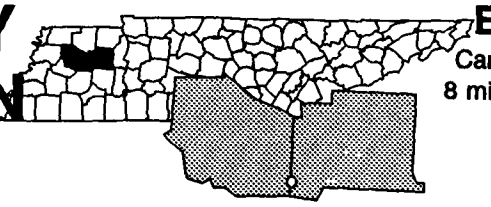
Environmental Progress

Initial investigations indicate the Memphis Defense Depot site does not pose an immediate threat to the health and safety of the nearby population while activities are being planned for permanent cleanup of the site.

Site Repository

Not established.

MILAN ARMY AMMUNITION PLANT



EPA REGION 4
Carroll and Gibson Counties
8 miles from the town of Milan

TENNESSEE

EPA ID# TN0210020582

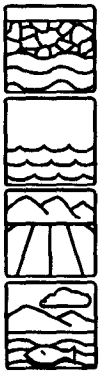
Site Description

The Milan Army Ammunition Plant site comprises 22,540 acres and is located in a rural area. The plant currently produces munitions for the Army and is operated by Martin Marietta Ordnance Systems, Inc. The "O"-Line, a conventional munitions demilitarization facility at Milan, has operated since 1942. The major mission of the "O"-Line is to remove TNT and other explosives from munitions by injecting a high-pressure stream of hot water and steam into the open cavity of the munitions. The resulting wastewater from these operations subsequently was discharged into 11 unlined settling ponds. The "O"-Line Pond Area is on the NPL, and 10 other areas are Solid Waste Management Units under the Resource Conservation and Recovery Act (RCRA). Approximately 9,000 people live in the town of Milan, located 5 miles from the facility and 8 miles from the NPL site. The nearest off-site residence is located approximately a mile from the facility. There are 1,400 employees of Martin Marietta, the current operator, working at the site. Three water supply wells serve the residents of Milan. Some private wells are located less than 3 miles from the area of known groundwater contamination. More than 13,000 people within 5 miles of the facility depend on groundwater as a source of drinking water.

Site Responsibility: The site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 06/10/86
Final Date: 08/21/87

Threats and Contaminants



On- and off-site groundwater, surface water, and sediments are contaminated with explosives and heavy metals including cadmium, mercury, and lead; volatile organic compounds (VOCs) such as chloroform, benzene, and methylene chloride; and nitrates and nitrites. Area residents may be subject to exposure to contaminants when drinking or coming into direct contact with polluted groundwater. Site-related contaminants have been detected in off-site surface water used for the watering of livestock, irrigation, and recreational purposes. Area residents could be exposed to contaminants in the surface water or by eating fish, crops, and locally raised meat and dairy products that contain bioaccumulated contaminants.

Cleanup Approach

The site is being addressed in three stages: initial actions and two long-term remedial phases directed at cleanup of the "O"-Line Ponds Area and of the entire site.

Response Action Status

Initial Actions: The Army had the unlined settling ponds dredged in 1971, and the soils were placed near the side of the ponds. Areas of surface soils suspected to be contaminated with the remnants of explosives were removed, and a multi-layer cover was placed on top of the ponds and the dredged soils in 1984. Wells to monitor the migration of site-related contaminants into the groundwater have been installed, and more wells will be installed. Activities associated with post-closure, such as maintenance of the grounds and fences, are underway. Regular sampling and analysis to monitor groundwater contamination of existing wells continues.

"O"-Line Ponds Area: The Army is investigating contaminants at the "O"-Line Ponds Area. The EPA reviewed the initial actions at the "O"-Line Ponds Area in 1987 to determine whether they are comparable to EPA guidelines for the investigation into the most effective ways to clean up the site and to ensure that it complies with the National Contingency Plan, the Federal regulations by which Superfund actions are conducted. An investigation of cleanup remedies started in 1990 at the "O"-Line Ponds Area and 10 other RCRA Solid Waste Management Units. A study of the feasibility of various cleanup alternatives for the "O"-Line Ponds soil was started in 1991. Development of a proposed plan for cleanup of the groundwater contaminants related to the "O"-Line Pond also began in 1992.

Entire Site: Following the completion of an interim investigation of the entire facility in 1991, further investigation of the ditches in the northern area and affected groundwater, believed to be related to traces of explosive compounds found in the city of Milan and private wells, were begun in 1992. Investigations into other areas are planned in 1992.

Site Facts: Milan Army Ammunition Plant is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities. The Army conducted a survey of area residents in 1988 to determine if they were concerned about potential health risks posed by the site. The results indicated a high degree of public interest and moderate concern for potential risks. The Milan Army Ammunition Plant has established a committee to review technical aspects of the site cleanup. This group includes private citizens from the community and local government. Several public meetings have been held to keep the community informed of the status of the site.

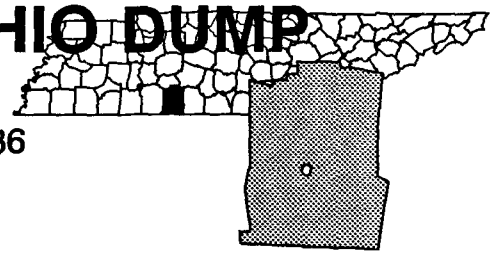
Environmental Progress

The covering of the "O"-Line Ponds and excavation of contaminated soils have made the site safer while further investigations continue, which will lead to selection of the final cleanup remedies for the Milan Army Ammunition Plant site.

Site Repository

Contact the Region 4 Superfund Community Relations Office.

MURRAY-OHIO DUMP
TENNESSEE
EPA ID# TND980728836



EPA REGION 4
Lawrence County
Lawrenceburg

Other Names:
Murray Ohio Site #2

Site Description

The 27-acre Murray-Ohio industrial dump accepted paint and electroplating sludges from 1963 until 1982. Wastes are buried on about 6 acres, and there is another 1/4-acre disposal area located 1,000 feet away from the site. Seeps containing heavy metal contamination have been observed along drainageways. Groundwater under the site and a tributary of Shoal Creek are thought to be contaminated with chromium. Shoal Creek is approximately a mile from the site. The main site was capped, revegetated, and is periodically maintained. Approximately 2,600 people live within 3 miles of the site. The closest residence is about 1/3 mile away. Public and private water supply wells lie within a 3-mile radius.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/01/83

Threats and Contaminants

On-site groundwater and soil are believed to contain contamination from heavy metals including chromium, nickel, and zinc, as well as volatile organic compounds (VOCs). Sediments and off-site surface water in a small tributary to Shoal Creek are thought to may be contaminated with heavy metals and also manganese and iron. Human health threats may arise from exposure to hazardous substances in contaminated groundwater, sediment, soil, and surface water. Groundwater poses the most significant health risk. Private wells within 1/3 mile of the site may be affected.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on soil and water cleanup at the site.

Response Action Status

Immediate Actions: Murray-Ohio Manufacturing capped and vegetated the site in 1981.

Soil and Water: Under EPA supervision, Murray-Ohio Manufacturing began an intensive study of soil and water pollution at the site in 1990. This investigation is exploring the nature and extent of contamination. Following this investigation, an evaluation of cleanup alternatives will be undertaken.

Site Facts: A Consent Order was agreed to in 1990, which requires Murray-Ohio Manufacturing to complete the study of the contamination at the site.

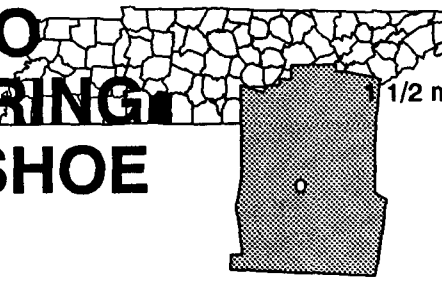
Environmental Progress

The immediate capping of the site reduced the potential for exposure at the Murray-Ohio Dump and helped to minimize the migration of contaminants while further investigations leading to the selection of cleanup activities are taking place.

Site Repository

Lawrenceburg Public Library, 519 East Garnes Road, Lawrenceburg, TN 38464

MURRAY-OHIO MANUFACTURING CO. (HORSESHOE BEND DUMP)



EPA REGION 4
Lawrence County
1/2 miles southwest of Lawrenceburg

Other Names:
Murray-Ohio Dump
Horseshoe Bend Dump

TENNESSEE

EPA ID# TND981014954

Site Description

Before 1956, a City of Lawrenceburg hydroelectric plant operated on the 12-acre Murray-Ohio Manufacturing Co. (Horseshoe Bend Dump) site. Beginning around 1956, workers poured paint sludge and other wastes into shallow pits at the site. They partially filled the pits after the liquid part of the wastes had soaked in and then placed drummed waste into them. In 1963, a large fire at the site produced toxic smoke and fumes that caused eye and lung irritation to residents near the site. Fish were killed in nearby Shoal Creek because of the fire. Following this, the operators apparently abandoned the dump. Since then, it has been used only for occasional dumping of household trash. In recent years, a nearby landowner restricted the access to the site. During a 1983 inspection, the Tennessee Division of Solid Waste Management found partially buried leaking drums at the site. Approximately 19,000 people obtain drinking water from wells and springs within 3 miles of the site. The City of Lawrenceburg gets part of its water supply from a large spring located a mile northeast of the site. Downstream from the dump, local residents use Shoal Creek for fishing and recreation.

Site Responsibility: This site is being addressed through Federal, municipal, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 08/30/90

Threats and Contaminants

The groundwater and soil may be contaminated with heavy metals including lead, zinc, nickel, and cadmium; volatile organic compounds (VOCs) may be present in groundwater and soil, as well. There is a possible risk to human health resulting from exposure through accidental ingestion of or direct contact with contaminated groundwater and soils. Geologic conditions make it easy for water to move under the site. Springs, caves, and sinkholes are plentiful, and the groundwater is near the land surface. These conditions help contaminants move through the groundwater under the site.

Cleanup Approach

This site is being addressed in two stages: an immediate action and a long-term remedial phase focusing on cleanup at the entire site.

Response Action Status

Immediate Action: Six thousand cubic yards of municipal waste and paint sludge were sent to an incinerator in 1989.

Entire Site: A Consent Order was signed in 1990, which required the Murray-Ohio Manufacturing Company and the City of Lawrenceburg, with EPA monitoring, to study contamination at the site. This study is exploring the nature and extent of any soil, groundwater, and surface water contamination. It is scheduled to be completed in 1992. Following completion of the report on this study, alternatives for cleanup will be explored.

Site Facts: Notice letters were sent to two parties potentially responsible for the site contamination, the City of Lawrenceburg and the Murray-Ohio Manufacturing Company. Murray-Ohio returned a positive response indicating that they wanted to conduct the study to determine the nature and extent of contamination. Both Murray-Ohio and the City of Lawrenceburg signed the Consent Order.

Environmental Progress

The removal of municipal wastes and paint sludges has reduced the potential for exposure at the Murray-Ohio Manufacturing Co. (Horseshoe Bend Dump) site while further investigations are taking place.

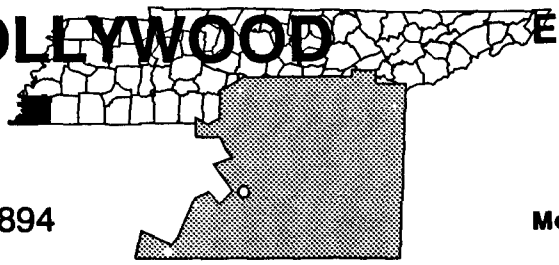
Site Repository

Lawrenceburg Public Library, 519 East Garnes Road, Lawernceburg, TN 38464

NORTH HOLLYWOOD DUMP

TENNESSEE

EPA ID# TND980558894



EPA REGION 4

Shelby County
North Memphis

Other Names:
Hollywood Dump
Memphis Public Works/ Hollywood Dump

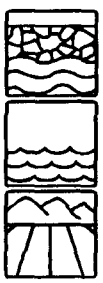
Site Description

The 70-acre North Hollywood Dump site was used as a municipal dump from the 1930s until the City closed it in 1967. However, some dumping of non-chemical refuse probably continued until 1980. In the late 1940s, the Hayden Chemical Company used the dump to dispose of wastes generated in the production of sodium hydrochloride. Hayden later was bought out by Velsicol Chemical Corporation, which continued the practice of dumping at the site. At one time, pesticide-contaminated sludge from a closed sewer line leading to the Velsicol plant was removed and buried in a small area known as the "Endrin Pit." In 1980, the EPA found pesticide products in surface soil, groundwater, and pond sediments on the dump. Because of high community concern in the early 1980s, the State of Tennessee recommended this site as the State's highest priority hazardous waste site. Approximately 10,000 people live within 3 miles of the dump site. An elementary school is situated close to the dump.

Site Responsibility: This site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 10/01/81
Final Date: 09/08/83

Threats and Contaminants



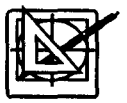
The groundwater and surface water ponds are contaminated with pesticides including endrin and heavy metals including copper, lead, and arsenic. The soil is contaminated with pesticides and heavy metals including lead. Accidentally drinking or otherwise coming into contact with contaminated groundwater, surface water, or soil could adversely affect the health of people. Also, people may be exposed to contaminants that may have entered the food chain through contaminated fish caught in ponds on or near the dump.

Cleanup Approach

This site is being addressed in two stages: emergency actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Emergency Actions: In 1980, the EPA took an emergency action to slow the movement of contaminants from the site. Also, the EPA installed a chain-link fence around the site and began a program to monitor the wastes on site. In 1981, a technical assistance group made up of representatives from the State, the City of Memphis, Shelby County, local industry, and the EPA, removed some of the chemical wastes from the surface.



Entire Site: In 1982, the EPA assumed the lead role from the State to complete investigations into the extent and nature of contamination at the North Hollywood Dump site. The potentially responsible parties took over in 1984. The study, completed in 1990, recommends retrofitting the landfill so that it measures up to legal sanitation standards. The selected remedy includes: placement of a 2-foot clay cap, grading, and revegetation; drainage of an adjacent 70-acre pond known to hold contaminated sediments; installing a 3-foot cover over the contaminated sediments; and the removal of fish found to be contaminated, followed by re-stocking of the pond. Groundwater will be monitored to ensure contamination levels remain low. In addition, the site will be fenced and restrictions on future use of the site will be put in place. The engineering design of the selected remedy began in December 1991. Cleanup activities are expected to begin in late 1993.

Site Facts: The State of Tennessee ordered the potentially responsible parties to investigate the site under State monitoring, which was agreed to in 1984. In late 1988, the EPA replaced the State in the monitoring role. In early 1991, two potentially responsible parties entered into a consent order with EPA to perform design and cleanup activities at the site.

Environmental Progress

The emergency actions to remove chemical wastes have reduced the potential for exposure to contaminated materials while further investigations and cleanup activities continue at the North Hollywood Dump site.

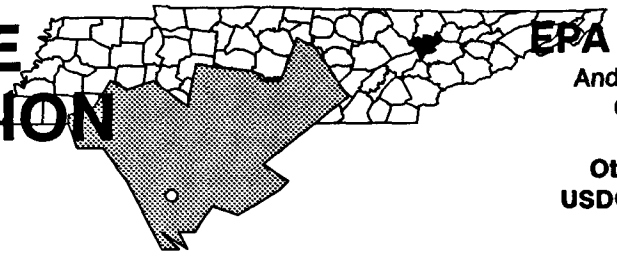
Site Repository

Memphis-Shelby County Public Library, 1850 Peabody Avenue, Memphis, TN 38104

OAK RIDGE RESERVATION (USDOE)

TENNESSEE

EPA ID# TN1890090003



EPA REGION 4

Anderson County
Oak Ridge

Other Names:
USDOE Oak Ridge

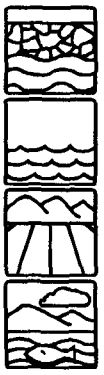
Site Description

The Oak Ridge Reservation site, operated by the U.S. Department of Energy (DOE), covers 58,000 acres and includes 650 known or suspected areas of contamination, as well as two off-site, surface water study areas (Clinch/Tennessee River and East Fork Poplar Creek). The site consists of three major facilities: a research lab that includes nuclear reactors, chemical and biological research programs, and production labs; a production complex that formerly enriched uranium-235 by gaseous diffusion; and a plant that formerly enriched uranium-235 by an electromagnetic process and now produces nuclear weapon components, processes nuclear materials, and performs other functions that relate to energy and the national defense. Site operations generate a variety of radioactive, non-radioactive, and mixed (radioactive and non-radioactive) hazardous wastes, many of which in the past were disposed of or stored on site. Leakage from inactive disposal and storage facilities, coupled with spills and other accidental releases, has contaminated many areas in and around the site. The DOE estimates that 773,000 pounds of elemental mercury were released in the 1950s and 1960s, and 170,000 pounds of mercury are in the sediments and floodplain of a 15-mile stretch of East Fork Poplar Creek, whose headwaters are near one of the site's production facilities. Approximately 500 pounds of mercury annually leave this watershed. An estimated 43,200 people obtain water from intakes along a 118-mile stretch below this site on the Tennessee River. Wetlands in the Blyth Ferry Water Fowl Management Area also are near the contaminated area.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 07/14/89
Final Date: 11/21/89

Threats and Contaminants

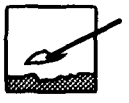


Heavy metals, organics, and radionuclides have been detected in on-site groundwater, surface water, and soil. Cesium-137 has been detected in sediments of the Tennessee River near Chattanooga, approximately 118 miles downstream of the site. Mercury has been detected in the sediments at East Fork Poplar Creek. Soils in the flood plain along the creek are contaminated with mercury. East Fork Poplar Creek flows through the City of Oak Ridge. People are potentially exposed to mercury-contaminated soils in the easily accessible areas of the creek floodplains. Fish and wildlife in and around the site may be threatened by site-related contaminants.

Cleanup Approach

This site is being addressed in seven stages: initial actions and six long-term remedial phases focusing on cleanup of the UNC Landfill, Mercury Tank Remediation, the Drum Storage Yard, the Oak Ridge National Laboratory - Waste Area Grouping 11, the entire site, and the remaining areas.

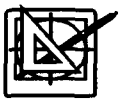
Response Action Status



Initial Actions: The DOE removed soil at several locations along the East Fork Poplar Creek where mercury levels were particularly high. The DOE also closed and capped some of the worst areas under the Resource Conservation and Recovery Act (RCRA) Program.

UNC Landfill: The UNC Landfill is a one-acre low-level radioactive landfill, located at the Y-12 plant on the Oak Ridge Reservation. The selected remedies include construction of a multi-layer closure cover and long-term monitoring. The design of the cleanup was begun in mid-1991 and actual cleanup activities are scheduled to begin in 1992.

Mercury Tank Remediation: An interim cleanup action is being taken to eliminate the continued release of mercury to the Upper East Fork Poplar Creek from sedimentation tanks. This is the first of several anticipated actions to clean up mercury contamination in the Upper East Fork Poplar Creek drainage basin. The selected remedy entails removal of the contaminated sediments that have accumulated in three tanks. Depending on its waste classification, the sediment will be dewatered and placed in containers for storage in an approved mixed-waste storage unit or shipped to a commercial, off-site Federally-approved facility for disposal.



The Drum Storage Yard: The drum storage yard is located at the K-25 Plant in the northwest section of the Oak Ridge Reservation. The drum storage yard temporarily stored treated sludges generated during the closure of two Federally-regulated impoundments in the late 1980s. In 1990, the EPA and the State of Tennessee ordered the DOE to remove 77,000 leaking drums. This activity is being carried out as an interim cleanup action. The remedy includes decanting of liquids from drums of solidified sludges, thermal dewatering and repackaging of raw sludges, and placement of all drums in indoor storage units. Design of the remedy began in late 1991 and is expected to be completed in late 1992.

Oak Ridge National Laboratory - Waste Area Grouping 11 (ORNL - WAG 11): The DOE began a study of the rad-contaminated surface debris at ORNL - WAG 11 to determine the nature and extent of contamination and has planned an interim cleanup action in 1993 to remove the debris.

Entire Site: The DOE has identified and combined several contaminated areas of the site and has begun a comprehensive study to determine the nature and extent of contamination and to identify alternatives for the cleanup. Investigations thus far have shown that several areas have been contaminated by a variety of sources including the Clinch River Study Area, the Oak Ridge National Laboratory - Waste Area Grouping 10, SW31 Spring at the K-23 Plant, the Upper East Fork Poplar Creek drainage basin, and the East Fork Poplar Creek-Sewerline Beltway. The cleanup of these areas will be performed in a series of source control actions followed by permanent cleanup actions.

Remaining Areas: The DOE will begin a study to determine the nature and extent of contamination at the remaining Oak Ridge Reservation areas, including the Abandoned Nitric Acid Pipeline. These investigations are expected to begin in mid-1992.

Site Facts: The DOE has removed contaminated soil and is conducting studies that require the DOE to close some units on site, conduct post-closure monitoring, and evaluate over 500 solid waste management units.

Environmental Progress

The soil cleanup performed at the Oak Ridge Reservation site has significantly reduced immediate threats while further studies and investigations take place.

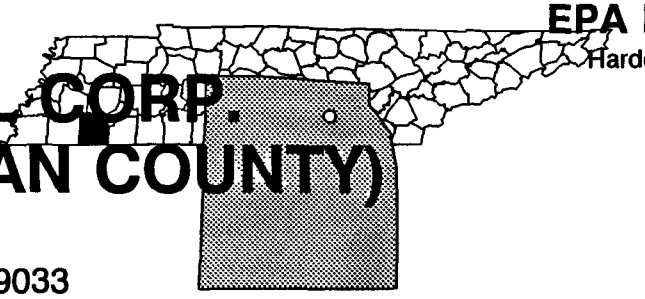
Site Repository

Oak Ridge Public Library, 1401 Oak Ridge Turnpike, Oak Ridge, TN 37830

VELSICOL CHEMICAL CORP. (HARDEMAN COUNTY)

TENNESSEE

EPA ID# TND980559033



EPA REGION 4
Hardeman County
Toone

Site Description

Velsicol Corporation purchased and used 242 acres of land as the Hardeman County landfill for disposal of pesticides and volatile organic compounds (VOCs), beginning in 1964. As of 1973, when the site was closed, waste had been disposed of in three specific areas, covering a total of approximately 27 acres. Approximately 130,000 drums of plant waste were disposed of in these three areas in trenches and were covered with 3 feet of soil. In 1980, a low permeability cap was installed over the surface of the three disposal areas, the surface was regraded to facilitate surface water drainage, sediment ponds were backfilled, and topsoil and seed for revegetation were applied. Currently, the site is fenced with barbed wire and has a locked gate. Approximately 60 people live within a 1-mile radius of the site. Since 1979, private wells in the vicinity have not been used for drinking water; alternate water supplies have been provided. There are public supply wells within a 3-mile radius of the site; however, monitoring data indicates that these wells are not contaminated.

Site Responsibility: This site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 12/01/82
Final Date: 09/08/83

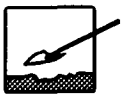
Threats and Contaminants

The groundwater is contaminated with various VOCs and chloroform. Capping, regrading, fencing, and security have virtually eliminated direct contact with the contaminants on the site. However, there may be a health threat if the contaminated groundwater in the area is used for drinking water.

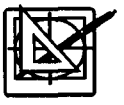
Cleanup Approach

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the groundwater and controlling the sources of contamination.

Response Action Status



Immediate Actions: As a result of chlorinated hydrocarbons detected in two residential wells adjacent to the site in 1979, an alternate water source was provided to 26 homes that were located within a 1-mile radius of the site. In 1980, capping, surface regrading, backfilling, and revegetating were performed.



Groundwater: In 1989, Velsicol Chemical Company began a study of the type and extent of groundwater contamination and an evaluation of alternative cleanup remedies. The investigation was completed in 1991. The plan for groundwater cleanup includes extraction of groundwater and treatment using settling tanks, air stripping, and carbon adsorption followed by the discharge of treated water to nearby surface water. In addition, fencing of the property, restrictions on use of wells, and monitoring the effectiveness of the remedy are included. Design of the cleanup activities began in December 1991.

Source Control: In 1991, the Velsicol Chemical Company initiated studies into the nature and extent of contamination sources at the site. These studies are expected to be completed by 1993.

Site Facts: Under an Administrative Order on Consent, Velsicol agreed to complete the remedial investigation and feasibility study, under EPA monitoring. Several citizens in the area around the site were involved in litigation with the Velsicol Chemical Company concerning pollution of their wells. Concerns about groundwater contamination were very high about 10 years ago, when water supply wells became contaminated but have lessened since alternate water supplies were provided. Velsicol is presently performing design and cleanup activities under a Unilateral Administrative Order.

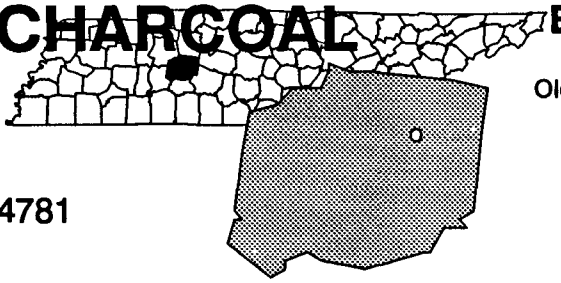
Environmental Progress

The initial actions to cap the surface of the site, secure access to the site, and provide an alternate water supply to nearby residents have eliminated immediate threats at the Velsicol Chemical Corp. (Hardeman County) site while further investigations leading to cleanup activities are taking place.

Site Repository

Velsicol Hardeman County Public Library, 213 North Washington Street, Belivaar, TN 38008

WRIGLEY CHARCOAL PLANT
TENNESSEE
EPA ID# TND980844781



EPA REGION 4
Hickman County
Old Charcoal Road, Wrigley

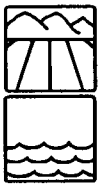
Site Description

The Wrigley Charcoal Plant site covers approximately 200 acres in and around the town of Wrigley. From the late 1800s to the early 1960s, a number of companies, including the Tennessee Products Corporation, produced charcoal briquettes, iron products, and wood alcohol on the site. After industrial and boot-legging activities ended, the Tennessee Farmers Co-op acquired the site and later sold a portion of it to an individual. During a 1985 inspection, the Tennessee Division of Solid Waste Management discovered pits containing a tar-like substance, waste piles, and old drums. Leachate was entering the north fork of Mill Creek, which is adjacent to the site. In 1985, the State, and, in 1986, the EPA detected toluene, benzenes, and phenols in the wastes and the leachate. The Bon Aqua Utility District maintains a drinking water intake in Mill Creek 1/2 miles downstream of the site. This intake serves an estimated 5,500 people. Approximately 300 people obtain drinking water from wells within 3 miles of the site.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 03/31/89

Threats and Contaminants



The leachate and wastes on the primary site and storage basin contain volatile organic compounds (VOCs) including toluene, benzene, and phenol and PAHs. The North Fork of Mill Creek is contaminated with low levels of the same elements as those found in the leachate. Health threats include the accidental ingestion of or direct contact with the wastes on site. Geologic conditions at the site make it easy for contaminants to move into the shallow groundwater, which lies about 5 feet below the site.

Cleanup Approach

The site is being addressed in four stages: immediate actions, an interim action and two long-term remedial phases focusing on cleanup of the coal-tar wastes and metals hot-spots and cleanup of the groundwater.

Response Action Status

Immediate Actions: In 1988, the EPA stabilized the tar pits by building a 16-foot berm to prevent erosion and seasonal flooding. A stream was rerouted to prevent leachate from entering Mill Creek. In 1989, the EPA excavated and shipped six truckloads of tar to a recycling facility. The recycling was incomplete, because large amounts of debris were still present in the tar.

Interim Action: In 1991, the EPA completed studies of the nature and extent of contamination from exposed coal tars, asbestos containing material, and metallic wastes at the Burn Pit. An interim remedy was selected in late 1991 which includes: posting access restrictions at the Storage Basin where coal-tar sludges were found, and reconstructing the spillway path. Design activities are expected to begin in late 1992.

Coal Tar Wastes and Metals Hot-Spots: The EPA is planning to begin a study of the nature and extent of contamination at the Storage Basin coal-tar wastes, Primary Site tarpits, and Primary Site coal-tar and metals hot-spots. When this study is completed, scheduled for late 1993, a remedy will be selected for cleanup of this part of the site.

Groundwater: In early 1989, the EPA began an investigation into the extent and nature of an on-site groundwater contamination. Once this investigation is completed, scheduled for 1992, a remedy will be selected for cleanup.

Site Facts: In 1989, the EPA sent out notice letters to the parties potentially responsible for the site contamination and asked them to participate in the site investigation. The public is concerned about the quality of the north fork of Mill Creek and the groundwater.

Environmental Progress

Stabilizing the tar pits and removing some of the contaminated materials from the Wrigley Charcoal Plant site have lessened any immediate threats to the community or the environment. Studies by the EPA are assessing the site contamination to determine the best permanent remedy for the site. In addition, completion of an interim remedy will reduce the most substantial threats to human health and the environment while long-term site cleanup options are being evaluated.

Site Repository

Hickman County Public Library, 120 West Swann Street, Centerville, TN 37033

GLOSSARY

Terms Used in the NPL Book

This glossary defines terms used throughout the NPL Volumes. The terms and abbreviations contained in this glossary apply specifically to work performed under the Superfund program in the context of hazardous waste management. These terms may have other meanings when used in a different context. A table of common toxic chemicals found at NPL sites, their sources, and their potential threats is located on page G-15

Acids: Substances, characterized by low pH (less than 7.0), that are used in chemical manufacturing. Acids in high concentration can be very corrosive and react with many inorganic and organic substances. These reactions possibly may create toxic compounds or release heavy metal contaminants that remain in the environment long after the acid is neutralized.

Administrative Order On Consent: A legal and enforceable agreement between the EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties (PRPs) agree to perform or pay for site studies or cleanups. It also describes the oversight rules, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. This Order is signed by PRPs and the government; it does not require approval by a judge.

Administrative Order [Unilateral]: A legally binding document issued by the EPA, directing the parties potentially responsible to perform site cleanups or studies (generally, the EPA does not issue Unilateral Orders for site studies). This type of Order is not signed by the PRPs and does not require approval by a judge.

Aeration: A process that promotes breakdown of contaminants in soil or water by exposing them to air.

Agency for Toxic Substances and Disease Registry (ATSDR): The Federal agency within the U.S. Public Health Service charged with carrying out the health-related responsibilities of CERCLA.

Air Stripping: A process whereby volatile organic chemicals (VOCs) are removed from contaminated material by forcing a stream of air through the contaminated material in a pressurized vessel. The contaminants are evaporated into the air stream. The air may be further treated before it is released into the atmosphere.

Ambient Air: Any unconfined part of the atmosphere. Refers to the air that may be inhaled by workers or residents in the vicinity of contaminated air sources.

Applicable or Relevant and Appropriate Requirements (ARARs): Federal, State, or local laws which apply to Superfund activities at NPL sites. Both emergency and long-term actions must comply with these laws or provide sound reasons for allowing a waiver. ARARs must be identified for each site relative to the characteristics of the site, the substances found at the site, or the cleanup alternatives being considered for the site.

GLOSSARY

Aquifer: An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces, or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be tapped and used for drinking or other purposes. The water contained in the aquifer is called groundwater. A "sole source aquifer" supplies 50 percent or more of the drinking water of an area.

Artesian (Well): A well made by drilling into the earth until water is reached, which, due to internal pressure, flows up like a fountain.

Asbestos: A mineral fiber that can pollute air or water and is known to cause cancer or asbestosis when inhaled.

Attenuation: The naturally occurring process by which a compound is reduced in concentration over time through adsorption, degradation, dilution, or transformation.

Background Level: The amount of a substance typically found in the air, water, or soil from natural, as opposed to human, sources.

Baghouse Dust: Dust accumulated in removing particulates from the air by passing it through cloth bags in an enclosure.

Bases: Substances characterized by high pH (greater than 7.0), which tend to be corrosive in chemical reactions. When bases are mixed with acids, they neutralize each other, forming salts.

Berm: A ledge, wall, or a mound of earth used to prevent the migration of contaminants.

Bioaccumulate: The process by which some contaminants or toxic chemicals gradually collect and increase in concentration in living tissue, such as in plants, fish, or people, as they breathe contaminated air, drink contaminated water, or eat contaminated food.

Biological Treatment: The use of bacteria or other microbial organisms to break down toxic organic materials into carbon dioxide and water.

Bioremediation: A cleanup process using naturally occurring or specially cultivated microorganisms to digest contaminants and break them down into non-hazardous components.

Bog: A type of wetland that is covered with peat moss deposits. Bogs depend primarily on moisture from the air for their water source, are usually acidic, and are rich in plant residue [see Wetland].

Boom: A floating device used to contain oil floating on a body of water or to restrict the potential overflow of waste liquids from containment structures.

Borehole: A hole that is drilled into the ground and used to sample soil or ground-water.

Borrow Pit: An excavated area where soil, sand, or gravel has been dug up for use elsewhere.

Cap: A layer of material, such as clay or a synthetic material, used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap generally is mounded or sloped so water will drain off.

Carbon Adsorption: A treatment system in which contaminants are removed from groundwater and surface water by forcing water through tanks containing activated carbon, a specially treated material that attracts and holds or retains contaminants.

Carbon Disulfide: A degreasing agent formerly used extensively for parts washing. This compound has both inorganic and organic

properties, which increase cleaning efficiency. However, these properties also cause chemical reactions that increase the hazard to human health and the environment.

Carbon Treatment: [see Carbon Adsorption].

Cell: In solid waste disposal, one of a series of holes in a landfill where waste is dumped, compacted, and covered with layers of dirt.

CERCLA: [see Comprehensive Environmental Response, Compensation, and Liability Act].

Characterization: The sampling, monitoring, and analysis of a site to determine the extent and nature of toxic releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Chemical Fixation: The use of chemicals to bind contaminants, thereby reducing the potential for leaching or other movement.

Chromated Copper Arsenate: An insecticide/herbicide formed from salts of three toxic metals: copper, chromium, and arsenic. This salt is used extensively as a wood preservative in pressure-treating operations. It is highly toxic and water-soluble, making it a relatively mobile contaminant in the environment.

Cleanup: Actions taken to eliminate a release or threat of release of a hazardous substance. The term "cleanup" sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Closure: The process by which a landfill stops accepting wastes and is shut down under Federal guidelines that ensure the protection of the public and the environment.

Comment Period: A specific interval during which the public can review and comment on various documents and EPA actions related to site cleanup. For example, a comment period is provided when the EPA proposes to add sites to the NPL. Also, there is minimum 3-week comment period for community members to review and comment on the remedy proposed to clean up a site.

Community Relations: The EPA effort to establish and maintain two-way communication with the public. The goals of community relations programs include creating an understanding of EPA programs and related actions, assuring public input into decision-making processes related to affected communities, and making certain that the Agency is aware of, and responsive to, public concerns. Specific community relations activities are required in relation to Superfund cleanup actions [see Comment Period].

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Congress enacted the CERCLA, known as Superfund, in 1980 to respond directly to hazardous waste problems that may pose a threat to the public health and the environment. The EPA administers the Superfund program.

Confluence: The place where two bodies of water, such as streams or rivers, come together.

Confined Aquifer: An aquifer in which groundwater is confined under pressure that is significantly greater than atmospheric pressure.

GLOSSARY

Consent Decree: A legal document, approved and issued by a judge, formalizing an agreement between the EPA and the parties potentially responsible for site contamination. The decree describes cleanup actions that the potentially responsible parties are required to perform, or the costs incurred by the government that the parties will reimburse, and the roles, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. If a settlement between the EPA and a potentially responsible party includes cleanup actions, it must be in the form of a Consent Decree. A Consent Decree is subject to a public comment period.

Consent Order: [see Administrative Order on Consent].

Containment: The process of enclosing or containing hazardous substances in a structure, typically in a pond or a lagoon, to prevent the migration of contaminants into the environment.

Contaminant: Any physical, chemical, biological, or radiological material or substance whose quantity, location, or nature produces undesirable health or environmental effects.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous wastes, or radioactive materials into the environment.

Cooperative Agreement: A contract between the EPA and the States, wherein a State agrees to manage or monitor certain site cleanup responsibilities and other activities on a cost-sharing basis.

Cost Recovery: A legal process by which potentially responsible parties can be required to pay back the Superfund program for money it spends on any cleanup actions [see Potentially Responsible Parties].

Cover: Vegetation or other material placed over a landfill or other waste material. It can be designed to reduce movement of water into the waste and to prevent erosion that could cause the movement of contaminants.

Creosotes: Chemicals used in wood preserving operations and produced by distillation of tar, including polycyclic aromatic hydrocarbons and polynuclear aromatic hydrocarbons [see PAHs and PNAs]. Contaminating sediments, soils, and surface water, creosotes may cause skin ulcerations and cancer through prolonged exposure.

Culvert: A pipe used for drainage under a road, railroad track, path, or through an embankment.

Decommission: To revoke a license to operate and take out of service.

Degradation: The process by which a chemical is reduced to a less complex form.

Degrease: To remove grease from wastes, soils, or chemicals, usually using solvents.

Deletion: A site is eligible for deletion from the NPL when Superfund response actions at the site are complete. A site is deleted from the NPL when a notice is published in the Federal Register.

De minimis: This legal phrase pertains to settlements with parties who contributed small amounts of hazardous waste to a site. This process allows the EPA to settle with small, or *de minimis* contributors, as a single group rather than as individuals, saving time, money, and effort.

Dewater: To remove water from wastes, soils, or chemicals.

Dike: A low wall that can act as a barrier to prevent a spill from spreading.

Dioxin: An organic chemical by-product of pesticide manufacture which is known to be one of the most toxic man-made chemicals.

Disposal: Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or incineration.

Downgradient: A downward hydrologic slope that causes groundwater to move toward lower elevations. Therefore, wells *downgradient* of a contaminated groundwater source are prone to receiving pollutants.

Ecological Assessment: A study of the impact of man-made or natural activity on living creatures and their environment.

Effluent: Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Emission: Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities.

Emulsifiers: Substances that help in mixing materials that do not normally mix; e.g., oil and water.

Endangerment Assessment: A study conducted to determine the risks posed to public health or the environment by contamination at NPL sites. The EPA or the State conducts the study when a legal action is to be taken to direct the potentially responsible parties to clean up a site or pay for the cleanup. An endangerment assessment supplements an investigation of the site hazards.

Enforcement: EPA, State, or local legal actions taken against parties to facilitate settlements; to compel compliance with laws, rules, regulations, or agreements; or to obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the specific requirements of different environmental laws and related regulatory requirements. Under CERCLA, for example, the EPA will seek to require potentially responsible parties to clean up a Superfund site or pay for the cleanup [see Cost Recovery].

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or surface runoff, but can be intensified by such land-related practices as farming, residential or industrial development, road building, or timber-cutting. Erosion may spread surface contamination to off-site locations.

Estuary (estuarine): Areas where fresh water from rivers and salt water from nearshore ocean waters are mixed. These areas may include bays, mouths of rivers, salt marshes, and lagoons. These water ecosystems shelter and feed marine life, birds, and wildlife.

Evaporation Ponds: Areas where sewage sludge or other watery wastes are dumped and allowed to dry out.

Feasibility Study: The analysis of the potential cleanup alternatives for a site. The feasibility study usually starts as soon as the remedial investigation is underway. In this volume, the feasibility study is referred to as a site study [see also Remedial Investigation].

Filtration: A treatment process for removing solid (particulate) matter from water by passing the water through sand, activated carbon, or a man-made filter. The process is often used to remove particles that contain contaminants.

Flood Plain: An area along a river, formed from sediment deposited by floods. Flood plains periodically are innundated by natural floods, which can spread contamination.

Flue Gas: The air that is emitted from a chimney after combustion in the burner occurs. The gas can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles, and many chemical pollutants.

Fly Ash: Non-combustible residue that results from the combustion of flue gases. It can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, as well as many other chemical pollutants.

French Drain System: A crushed rock drain system constructed of perforated pipes, which is used to drain and disperse wastewater.

Gasification (coal): The conversion of soft coal into gas for use as a fuel.

General Notice Letter: [See Notice Letter].

Generator: A facility that emits pollutants into the air or releases hazardous wastes into water or soil.

Good Faith Offer: A voluntary offer, generally in response to a Special Notice letter, made by a potentially responsible party, consisting of a written proposal demonstrating a potentially responsible party's qualifications and willingness to perform a site study or cleanup.

Groundwater: Water that fills pores in soils or openings in rocks to the point of saturation. In aquifers, groundwater occurs in sufficient quantities for use as drinking and irrigation water and other purposes.

Groundwater Quality Assessment: The process of analyzing the chemical characteristics of groundwater to determine whether any hazardous materials exist.

Halogens: Reactive non-metals, such as chlorine and bromine. Halogens are very good oxidizing agents and, therefore, have many industrial uses. They are rarely found by themselves; however, many chemicals such as polychlorinated biphenyls (PCBs), some volatile organic compounds (VOCs), and dioxin are reactive because of the presence of halogens.

Hazard Ranking System (HRS): The principal screening tool used by the EPA to evaluate relative risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. The HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or groundwater and on other factors such as nearby population. The HRS score is the primary factor in deciding if the site should be on the NPL.

Hazardous Waste: By-products of society that can pose a substantial present or potential hazard to human health and the environment when improperly managed. Hazardous waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Heavy Metals: Metallic elements with high atomic weights, such as arsenic, lead, mercury, and cadmium. Heavy metals are very hazardous even at low concentrations and tend to accumulate in the food chain.

Herbicide: A chemical pesticide designed to control or destroy plants, weeds, or grasses.

Hot Spot: An area or vicinity of a site containing exceptionally high levels of contamination.

Hydrocarbons: Chemical compounds that consist entirely of hydrogen and carbon.

Hydrology: The properties, distribution, and circulation of water.

Hydrogeology: The geology of groundwater, with particular emphasis on the chemistry and movement of water.

Impoundment: A body of water or sludge confined by a dam, dike, floodgate, or other barrier.

Incineration: A group of treatment technologies involving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to reduce the remaining residues to a non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations.

Infiltration: The movement of water or other liquid down through soil from precipitation (rain or snow) or from application of wastewater to the land surface.

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

Injection Well: A well into which waste fluids are placed, under pressure, for purposes of disposal.

Inorganic Chemicals: Chemical substances of mineral origin, not of basic carbon structure.

Installation Restoration Program: The specially funded program established in 1978 under which the Department of Defense has been identifying and evaluating its hazardous waste sites and controlling the migration of hazardous contaminants from those sites.

Intake: The source from where a water supply is drawn, such as from a river or water body.

Interagency Agreement: A written agreement between the EPA and a Federal agency that has the lead for site cleanup activities, setting forth the roles and responsibilities of the agencies for performing and overseeing the activities. States often are parties to interagency agreements.

Interim (Permit) Status: Conditions under which hazardous waste treatment, storage, and disposal facilities, that were operating when regulations under the RCRA became final in 1980, are temporarily allowed by the EPA to continue to operate while awaiting denial or issuance of a permanent permit. The facility must comply with certain regulations to maintain interim status.

Lagoon: A shallow pond or liquid waste containment structure. Lagoons typically are used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

Landfarm: To apply waste to land or incorporate waste into the surface soil, such as fertilizer or soil conditioner. This practice commonly is used for disposal of composted wastes and sludges.

Landfill: A disposal facility where waste is placed in or on land. *Sanitary* landfills are disposal sites for non-hazardous solid wastes. The waste is spread in layers, compacted to the smallest practical volume, and covered with soil at the end of each operating day. Secure *chemical* landfills are disposal sites for hazardous waste. They are designed to minimize the chance of release of hazardous substances into the environment [see Resource Conservation and Recovery Act].

Leach, Leaching [v.t.]: The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

Leachate [n]: The liquid that trickles through or drains from waste, carrying soluble components from the waste.

Leachate Collection System: A system that gathers liquid that has leaked into a landfill or other waste disposal area and pumps it to the surface for treatment.

Liner: A relatively impermeable barrier designed to prevent leachate (waste residue) from leaking from a landfill. Liner materials include plastic and dense clay.

Long-term Remedial Phase: Distinct, often incremental, steps that are taken to solve site pollution problems. Depending on the complexity, site cleanup activities can be separated into several of these phases.

Long-term Response Action: An action which requires a continuous period of on-site activity before cleanup goals are achieved. These actions typically include the extraction and treatment of groundwater and monitoring actions.

Marsh: A type of wetland that does not contain peat moss deposits and is dominated by vegetation. Marshes may be either fresh or saltwater and tidal or non-tidal [see Wetland].

Migration: The movement of oil, gas, contaminants, water, or other liquids through porous and permeable soils or rock.

Mill Tailings: [See Mine Tailings].

Mine Tailings: A fine, sandy residue left from mining operations. Tailings often contain high concentrations of lead, uranium, and arsenic or other heavy metals.

Mitigation: Actions taken to improve site conditions by limiting, reducing, or controlling toxicity and contamination sources.

Modeling: A technique using a mathematical or physical representation of a system or theory that tests the effects that changes on system components have on the overall performance of the system.

Monitoring Wells: Special wells drilled at specific locations within, or surrounding, a hazardous waste site where groundwater can be sampled at selected depths and studied to obtain such information as the direction in which groundwater flows and the types and amounts of contaminates present.

National Priorities List (NPL): The EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. The EPA is required to update the NPL at least once a year.

Natural Attenuation: [See Attenuation].

Neutrals: Organic compounds that have a relatively neutral pH, complex structure and, due to their organic bases, are easily absorbed into the environment. Water is the most commonly known neutral, however, naphthalene, pyrene, and trichlorobenzene also are examples of neutrals.

Nitroaromatics: Common components of explosive materials, which will explode if activated by very high temperatures or pressures; 2,4,6-Trinitrotoluene (TNT) is a nitroaromatic.

Notice Letter: A General Notice Letter notifies the parties potentially responsible for site contamination of their possible liability. A Special Notice Letter begins a 60-day formal period of negotiation during which the EPA is not allowed to start work at a site or initiate enforcement actions against potentially responsible parties, although the EPA may undertake certain investigatory and planning activities.

The 60-day period may be extended if the EPA receives a good faith offer from the PRPs within that period. [See also Good Faith Offer].

On-Scene Coordinator (OSC): The predesignated EPA, Coast Guard, or Department of Defense official who coordinates and directs Superfund removal actions or Clean Water Act oil- or hazardous-spill corrective actions.

Operation and Maintenance: Activities conducted at a site after a cleanup action is completed to ensure that the cleanup or containment system is functioning properly.

Organic Chemicals/Compounds: Chemical substances containing mainly carbon, hydrogen, and oxygen.

Outfall: The place where wastewater is discharged into receiving waters.

Overpacking: Process used for isolating large volumes of waste by jacketing or encapsulating waste to prevent further spread or leakage of contaminating materials. Leaking drums may be contained within oversized barrels as an interim measure prior to removal and final disposal.

Pentachlorophenol (PCP): A synthetic, modified petrochemical that may be used as a wood preservative because of its toxicity to termites and fungi. It is a common component of creosotes and can cause cancer.

Perched (groundwater): Groundwater separated from another underlying body of groundwater by a confining layer, often clay or rock.

Percolation: The downward flow or filtering of water or other liquids through subsurface rock or soil layers, usually continuing downward to groundwater.

Pesticide: A substance or mixture of substances intended to prevent, destroy, or repel any pest. If misused, pesticides can accumulate in the foodchain and contaminate the environment.

Petrochemicals: Chemical substances produced from petroleum in refinery operations and as fuel oil residues. These include fluoranthene, chrysene, mineral spirits, and refined oils. Petrochemicals are the bases from which volatile organic compounds (VOCs), plastics, and many pesticides are made. These chemical substances often are toxic to humans and the environment.

Phenols: Organic compounds that are used in plastics manufacturing and are by-products of petroleum refining, tanning, textile, dye, and resin manufacturing. Phenols are highly poisonous.

Physical Chemical Separation: The treatment process of adding a chemical to a substance to separate the compounds for further treatment or disposal.

Pilot Testing: A small-scale test of a proposed treatment system in the field to determine its ability to clean up specific contaminants.

Plugging: The process of stopping the flow of water, oil, or gas into or out of the ground through a borehole or well penetrating the ground.

Plume: A body of contaminated groundwater flowing from a specific source. The movement of the groundwater is influenced by such factors as local groundwater flow patterns, the character of the aquifer in which groundwater is contained, and the density of contaminants [see Migration].

Pollution: Generally, the presence of matter or energy whose nature, location, or quantity produces undesired health or environmental effects.

Polycyclic Aromatic Hydrocarbons or Polyaromatic Hydrocarbons (PAHs): PAHs, such as pyrene, are a group of highly reactive organic compounds found in motor oil. They are a common component of creosotes and can cause cancer.

Polychlorinated Biphenyls (PCBs): A group of toxic chemicals used for a variety of purposes including electrical applications, carbonless copy paper, adhesives, hydraulic fluids, microscope immersion oils, and caulking compounds. PCBs also are produced in certain combustion processes. PCBs are extremely persistent in the environment because they are very stable, non-reactive, and highly heat resistant. Chronic exposure to PCBs is believed to cause liver damage. It also is known to bioaccumulate in fatty tissues. PCB use and sale was banned in 1979 with the passage of the Toxic Substances Control Act.

Polynuclear Aromatic Hydrocarbons (PNAs): PNAs, such as naphthalene, and biphenyls, are a group of highly reactive organic compounds that are a common component of creosotes, which can be carcinogenic.

Polyvinyl Chloride (PVC): A plastic made from the gaseous substance vinyl chloride. PVC is used to make pipes, records, raincoats, and floor tiles. Health risks from high concentrations of vinyl chloride include liver cancer and lung cancer, as well as cancer of the lymphatic and nervous systems.

Potable Water: Water that is safe for drinking and cooking.

Potentially Responsible Parties (PRPs): Parties associated with a Superfund site who may be liable for the cost of remedying the release of hazardous substances. This may include owners or operators of the site or transporters who disposed of materials at the site. PRPs may admit liability, or liability may be determined by a court of law. PRPs may sign a Consent Decree or Administrative Order on Consent to participate in the site cleanup without admitting liability.

Precipitation: The removal of solids from liquid waste so that the solid and liquid portions can be disposed of safely; the removal of particles from airborne emissions. Electrochemical precipitation is the use of an anode or cathode to remove the hazardous chemicals. Chemical precipitation involves the addition of some substance to cause the solid portion to separate.

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected waste site or release to determine if a threat or potential threat exists.

Pump and Treat: A groundwater cleanup technique involving the extracting of contaminated groundwater from the subsurface and the removal of contaminants, using one of several treatment technologies.

Radionuclides: Elements, including radium and uranium-235 and -238, which break down and produce radioactive substances due to their unstable atomic structure. Some are man-made, and others are naturally occurring in the environment. Radon, the gaseous form of radium, decays to form alpha particle radiation, which cannot be absorbed through skin. However, it can be inhaled, which allows alpha particles to affect unprotected tissues directly and thus cause cancer. Radiation also occurs naturally through the breakdown of granite.

RCRA: [See Resource Conservation and Recovery Act].

Recharge Area: A land area where rainwater saturates the ground and soaks through the earth to reach an aquifer.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used to clean up sites listed on the NPL. It is based on information generated during the remedial investigation and feasibility study and consideration of public comments and community concerns.

Recovery Wells: Wells used to withdraw contaminants or contaminated groundwater.

Recycle: The process of minimizing waste generation by recovering usable products that might otherwise become waste.

Remedial Action (RA): The actual construction or implementation phase of a Superfund site cleanup following the remedial design [see Cleanup].

Remedial Design: A phase of site cleanup where engineers design the technical specifications for cleanup remedies and technologies.

Remedial Investigation: An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish the criteria for cleaning up the site, identify the preliminary alternatives for cleanup actions, and support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. In this volume, the remedial investigation is referred to as a site study [see also Feasibility Study].

Remedial Project Manager (RPM): The EPA or State official responsible for overseeing cleanup actions at the site.

Remedy Selection: The selection of the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy is selected [see Record of Decision].

Removal Action: Short-term immediate actions taken to address releases of hazardous substances [see Cleanup].

Residual: The amount of a pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or the particulates remaining in air after the air passes through a scrubber.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Retention Pond: A small body of liquid used for disposing of wastes and containing overflow from production facilities. Sometimes retention ponds are used to expand the capacity of such structures as lagoons the store waste.

Runoff: The discharge of water over land into surface water. It can carry pollutants from the air and land and spread contaminants from its source.

Scrubber: An air pollution control device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

Sediment: The layer of soil, sand, and minerals at the bottom of surface waters such as streams, lakes, and rivers, that absorbs contaminants.

Seeps: Specific points where releases of liquid, usually leachate, form from waste disposal areas, particularly along the lower edges of landfills.

Seepage Pits: A hole, shaft, or cavity in the ground used for the storage of liquids, usually in the form of leachate, from waste disposal areas. The liquid gradually leaves the pit by moving through the surrounding soil.

Septage: Residue remaining in a septic tank after the treatment process.

Sinkhole: A hollow depression in the land surface in which drainage collects; associated with underground caves and passages that facilitate the movement of liquids.

Site Characterization: The technical process used to evaluate the nature and extent of environmental contamination, which is necessary for choosing and designing cleanup measures and monitoring their effectiveness.

Site Inspection: The collection of information from a hazardous waste site to determine the extent and severity of hazards posed by the site. It follows, and is more extensive than, a preliminary assessment. The purpose is to gather information necessary to score the site, using the Hazard Ranking System, and to determine if the site presents an immediate threat that requires a prompt removal action.

Slag: The fused refuse or dross separated from a metal in the process of smelting.

Sludge: Semi-solid residues from industrial or water treatment processes that may be contaminated with hazardous materials.

Slurry Wall: Barriers used to contain the flow of contaminated groundwater or subsurface liquids. Slurry walls are constructed by digging a trench around a contaminated area and filling the trench with an impermeable material that prevents water from passing through it. The groundwater or contaminated liquids trapped within the area surrounded by the slurry wall can be extracted and treated.

Smelter: A facility that melts or fuses ore, often with an accompanying chemical change, to separate the metal. Emissions from smelters are known to cause pollution.

Soil Gas: Gaseous elements and compounds that occur in the small spaces between particles of soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil Vapor Extraction: A treatment process that uses vacuum wells to remove hazardous gases from soil.

Soil Washing: A water-based process for mechanically scrubbing soils in-place to remove undesirable materials. There are two approaches: dissolving or suspending them in the wash solution for later treatment by conventional methods, and concentrating them into a smaller volume of soil through simple particle size separation techniques [see Solvent Extraction].

Stabilization: The process of changing an active substance into inert, harmless material, or physical activities at a site that act to limit the further spread of contamination without actual reduction of toxicity.

Solidification/Stabilization: A chemical or physical reduction of the mobility of hazardous constituents. Mobility is reduced through the binding of hazardous constituents into a solid mass with low permeability and resistance to leaching.

Solvent: A substance capable of dissolving another substance to form a solution. The primary uses of industrial solvents are as cleaners for degreasing, in paints, and in pharmaceuticals. Many solvents are flammable and toxic to varying degrees.

Solvent Extraction: A means of separating hazardous contaminants from soils, sludges, and sediment, thereby reducing the volume of the hazardous waste that must be treated. It generally is used as one in a series of unit operations. An organic chemical is used to dissolve contaminants as opposed to water-based compounds, which usually are used in soil washing.

Sorption: The action of soaking up or attracting substances. It is used in many pollution control systems.

Special Notice Letter: [See Notice Letter].

Stillbottom: Residues left over from the process of recovering spent solvents.

Stripping: A process used to remove volatile contaminants from a substance [see Air Stripping].

Sumps: A pit or tank that catches liquid runoff for drainage or disposal.

Superfund: The program operated under the legislative authority of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) to update and improve environmental laws. The program has the authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health, welfare, or the environment. The "Superfund" is a trust fund that finances cleanup actions at hazardous waste sites.

Surge Tanks: A holding structure used to absorb irregularities in flow of liquids, including liquid waste materials.

Swamp: A type of wetland that is dominated by woody vegetation and does not accumulate peat moss deposits. Swamps may be fresh or saltwater and tidal or non-tidal [see Wetlands].

Thermal Treatment: The use of heat to remove or destroy contaminants from soil.

Treatability Studies: Testing a treatment method on contaminated groundwater, soil, etc., to determine whether and how well the method will work.

Trichloroethylene (TCE): A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled, ingested, or through skin contact and can damage vital organs, especially the liver [see Volatile Organic Compounds].

Unilateral [Administrative] Order: [see Administrative Order].

Upgradient: An upward hydrologic slope; demarks areas that are higher than contaminated areas and, therefore, are not prone to contamination by the movement of polluted groundwater.

Vacuum Extraction: A technology used to remove volatile organic compounds (VOCs) from soils. Vacuum pumps are connected to a series of wells drilled to just above the water table. The wells are sealed tightly at the soil surface, and the vacuum established in the soil draws VOC-contaminated air from the soil pores into the well, as fresh air is drawn down from the surface of the soil.

Vegetated Soil Cap: A cap constructed with graded soils and seed for vegetative growth, to prevent erosion [see Cap].

Vitrification: The process of electrically melting wastes and soils or sludges to bind the waste in a glassy, solid material more durable than granite or marble and resistant to leaching.

Volatile Organic Compounds (VOCs): VOCs are manufactured as secondary petrochemicals. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and widespread industrial use, they are commonly found in soil and groundwater.

Waste Treatment Plant: A facility that uses a series of tanks, screens, filters, and other treatment processes to remove pollutants from water.

Wastewater: The spent or used water from individual homes or industries.

Watershed: The land area that drains into a stream or other water body.

Water Table: The upper surface of the groundwater.

Weir: A barrier to divert water or other liquids.

Wetland: An area that is regularly saturated by surface or groundwater and, under normal circumstances, is capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are nontidal and freshwater. Coastal wetlands are an integral component of estuaries.

Wildlife Refuge: An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

Some Common Contaminants at NPL Sites

Contaminant Category	Example Chemical Types	Sources	Potential Health Threats*
Heavy Metals	Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Lead, Manganese, Mercury, Nickel, Silver, Selenium, Zinc	Electroplating, batteries, paint pigments, photography, smelting, thermometers, fluorescent lights, solvent recovery	Tumors, cancers, and kidney, brain, neurological, bone and liver damage
Volatile Organic Compounds (VOCs)	Trichloroethylene (TCE), Perchloroethylene (PCE), Acetone, Benzene, Ketone, Methyl chloride, Toluene, Vinyl Chloride, Dichlorethylene	Solvents and degreasers, gasoline octane enhancers, oils and paints, dry cleaning fluids, chemical manufacturing.	Cancers, kidney and liver damage, impairment of the nervous system resulting in sleepiness and headaches, leukemia
Pesticides/ Herbicides	Chlordane, DDT 4-4, DDE, Heptachlor, Aldrin, Endrin, Atrazine, Dieldrin, Toxaphene	Agricultural applications, pesticide and herbicide production	Various effects ranging from nausea to nervous disorders. Dioxin is a common by-product of the manufacture of pesticides and is both highly toxic and a suspected carcinogen.
Polychlorinated biphenyls (PCBs)	—	Electric transformers and capacitors, insulators and coolants, adhesives, caulking compounds, carbonless copy paper, hydraulic fluids.	Cancer and liver damage.
Creosotes	Polyaromatic hydrocarbons (PAHs), Polynuclear aromatics (PNAs), Phenolic Tars, Pentachlorophenol (PCP)	Wood preserving, fossil fuel combustion	Cancers and skin ulcerations with prolonged exposure
Radiation (Radionuclides)	Radium-226, Radon, Uranium-235, Uranium-238	Mine tailings, radium products, natural decay of granites	Cancer

Sources: *Toxic Chemicals—What They Are, How They Affect You (EPA, Region 5)*
Glossary of Environmental Terms (EPA, 1988)

**The potential for risk due to these contaminants is linked to a number of factors; for example, the length and level of exposure and environmental and health factors such as age.*